Chesapeake Lighthouse and Aircraft Measurements for Satellites (CLAMS : July 10 – Aug 2, 2001)

Mission Summary

W. L. Smith Jr.
NASA LaRC

CLAMS Flight Summary

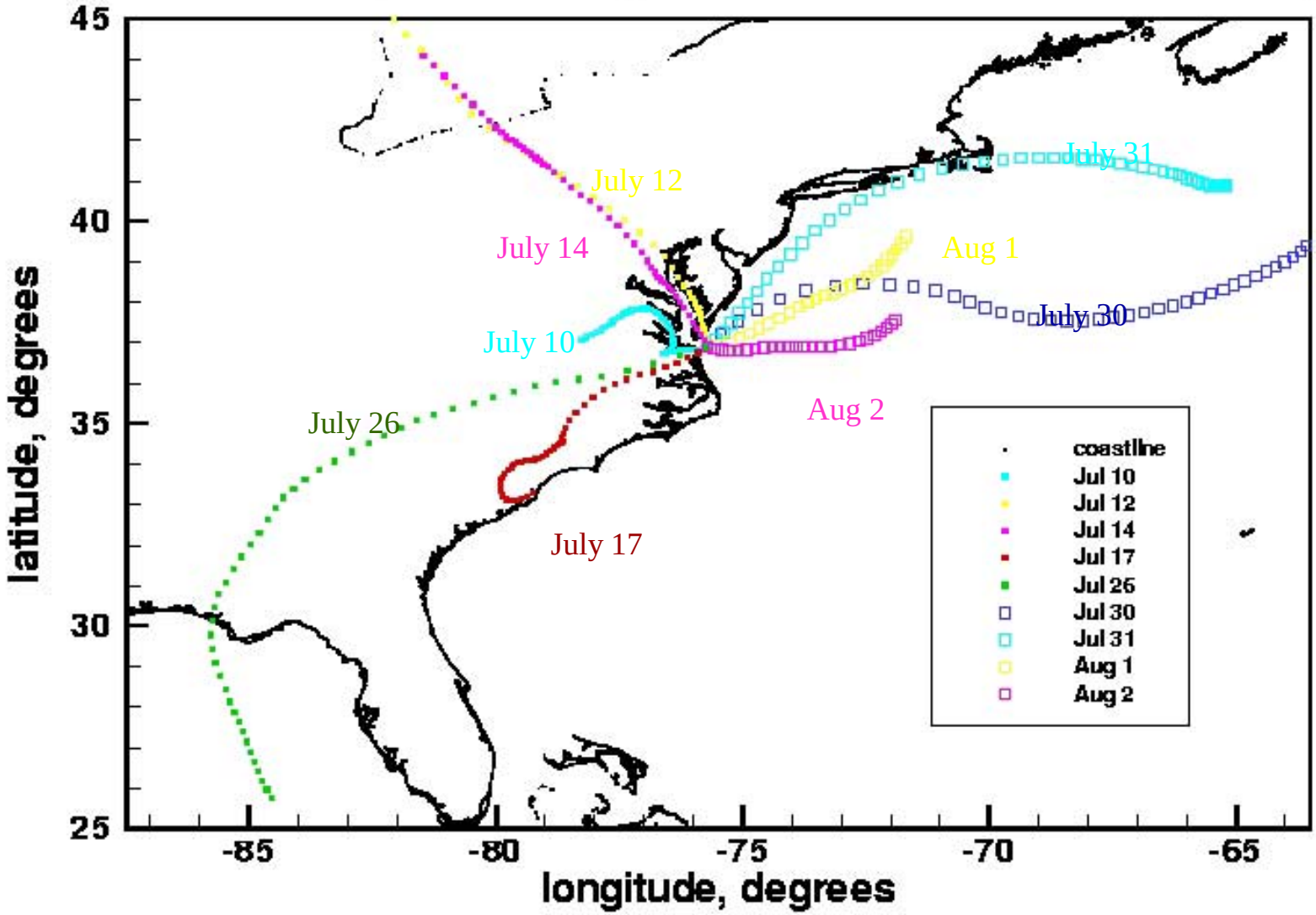
Date (2001)	Aircraft	Location	AOT (500nm)	Sky Cond.
10-Jul	1,2,4,5	COVE	0.23	Clear
12-Jul	1,2,3,4	COVE, E of Wallops	0.08	Scat. Cirrus
14-Jul	1,2,4,5	COVE	0.08	few Cu
17-Jul	1,2,3,4,5,6	COVE	0.47	Clear
23-Jul	1	E of Wallops	0.06	Clear
26-Jul	1,2,4	COVE/Bouy 44014	0.17	Mostly Clear
30-Jul	1,2,3,4	COVE/Buoy 44014	0.06	Low Clouds
31-Jul	1,2,3	Deep Ocn Bouy 44004/ D.Swamp	0.08	broken Cu
2-Aug	1,2,3	COVE	0.1	Clear

1. **UW CV-580:** ***AATS-14, CAR, BBSW, UV, in-situ Aerosols, scattering, absorption***
2. **LaRC OV-10:** ***BBSW, BBLW, Spectral SW***
3. **NASA ER-2:** ***AirMISR, MAS, S-HIS, AVIRIS***
4. **Proteus:** ***NAST-I, NAST-M, FIRSC***
5. **Cessna 210:** ***Research Scanning Polarimeter***
6. **Lear 25C:** ***LAABS (LaRC A-band)***

*note: the Cessna and Proteus flew missions on other days to accomplish other objectives

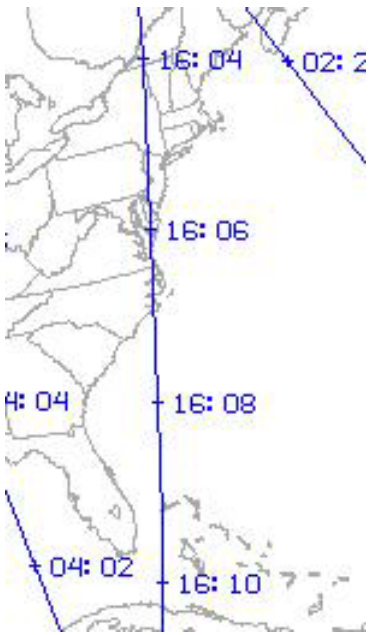
NOAA AIR RESOURCES LABORATORY HYSPLIT4 RESULTS

48 hours Backward Trajectories Ending- Solar Noon on CLAMS Measurement Days

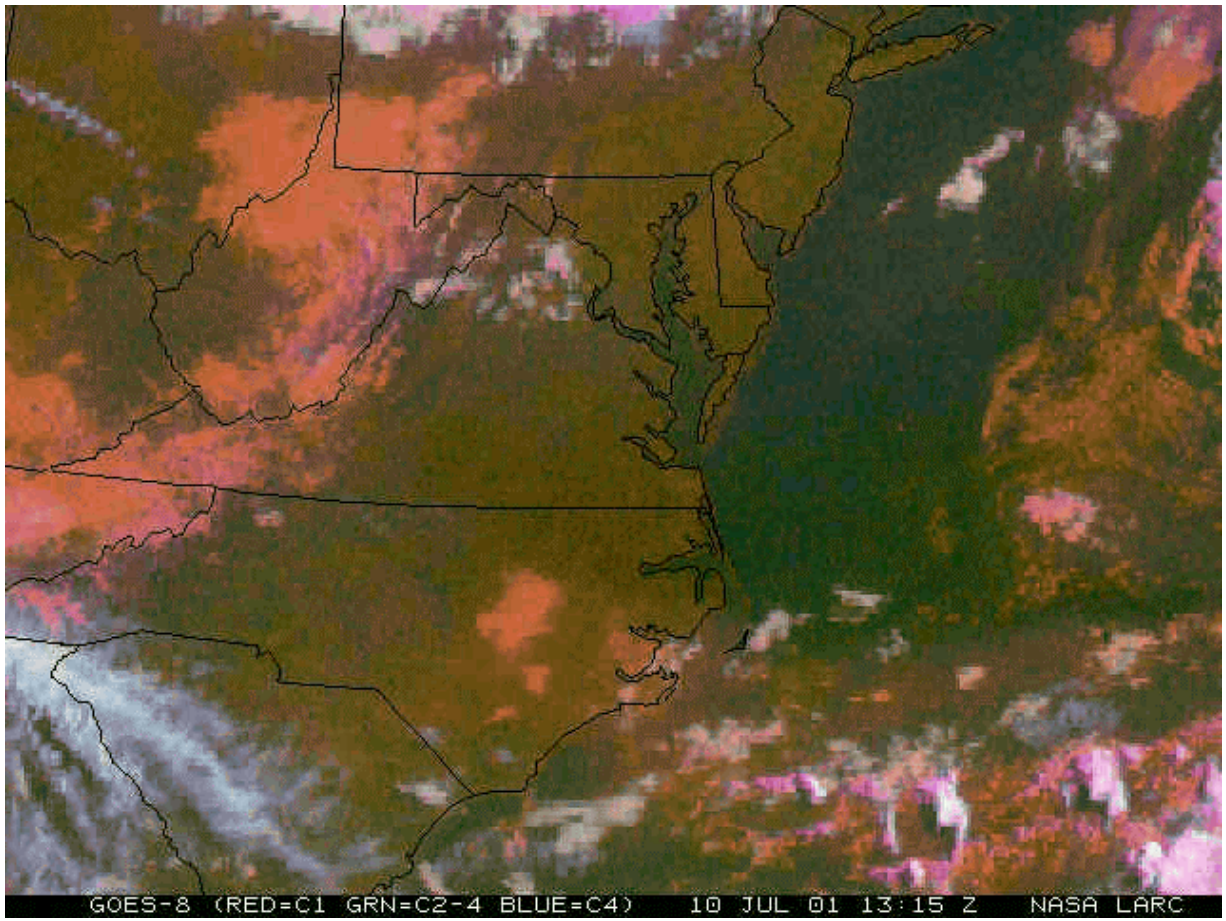


CLAMS: JULY 10, 2001
Satellite

TERRA

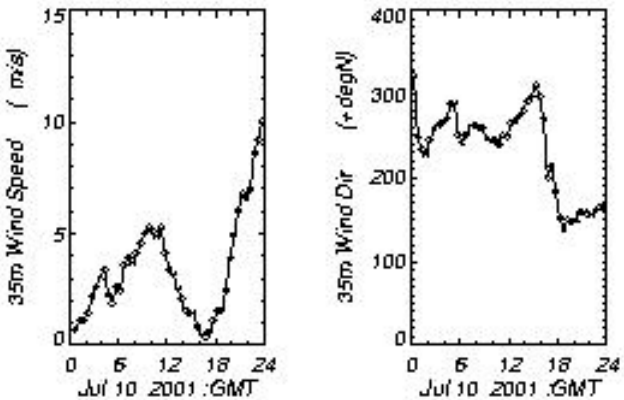


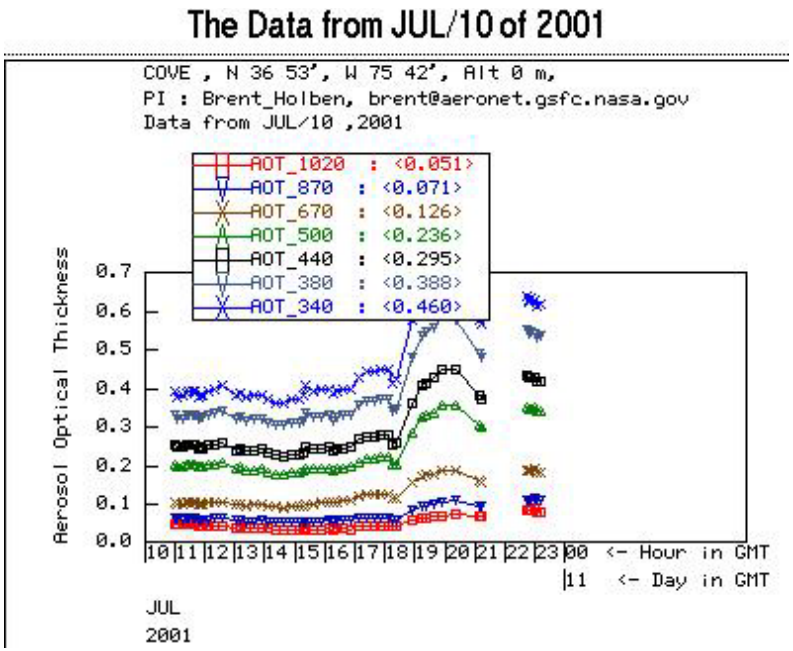
VZA = 2°

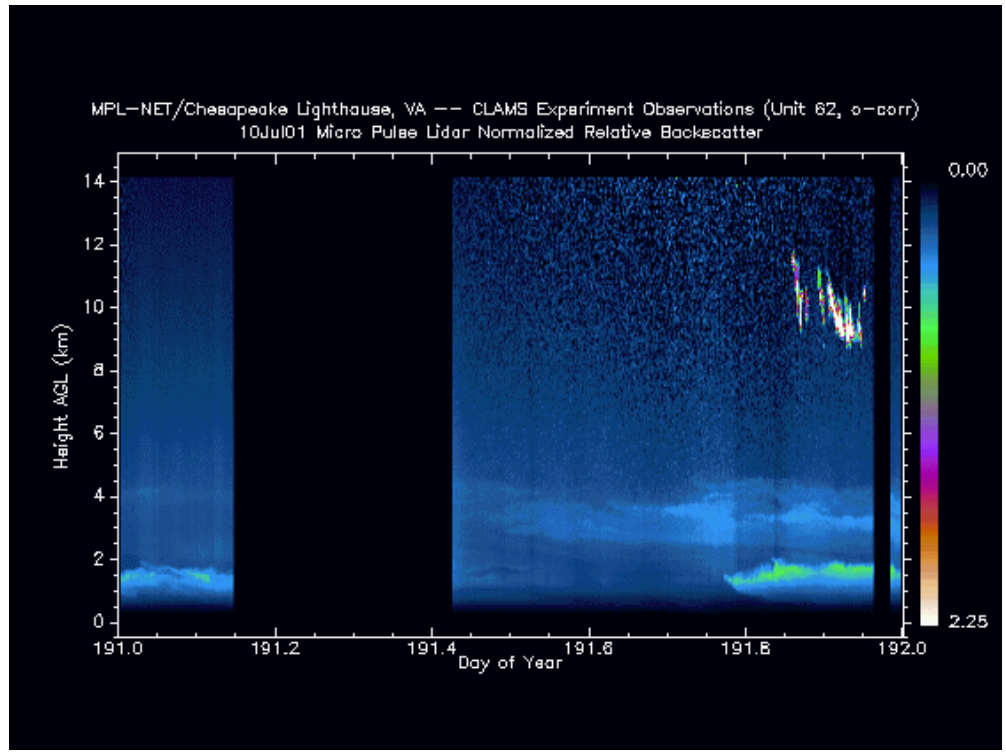


CLAMS: July 10, 2001

COVE WINDS



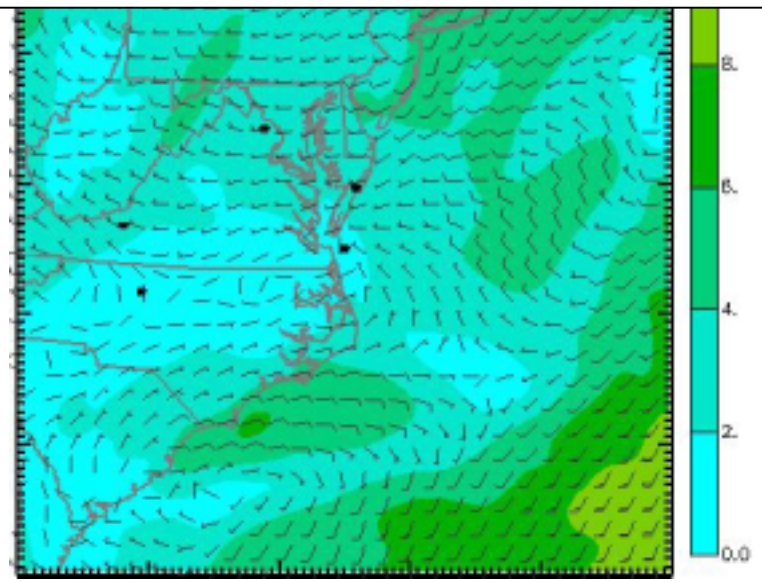


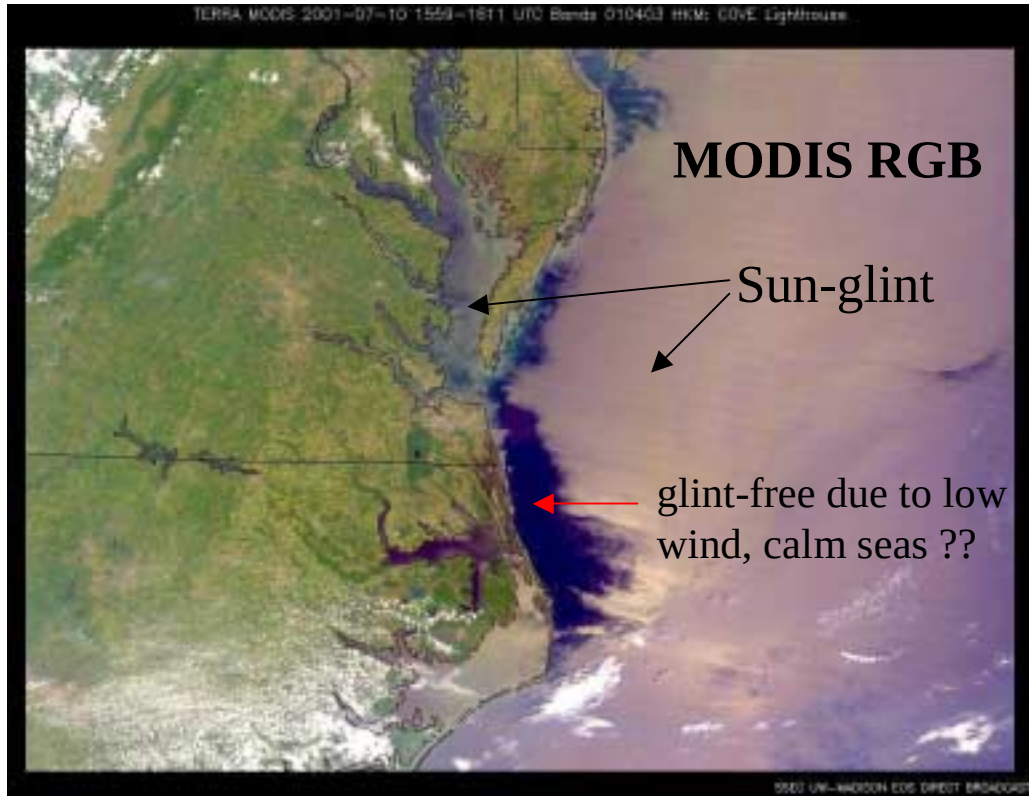


CLAMS: July 10, 2001

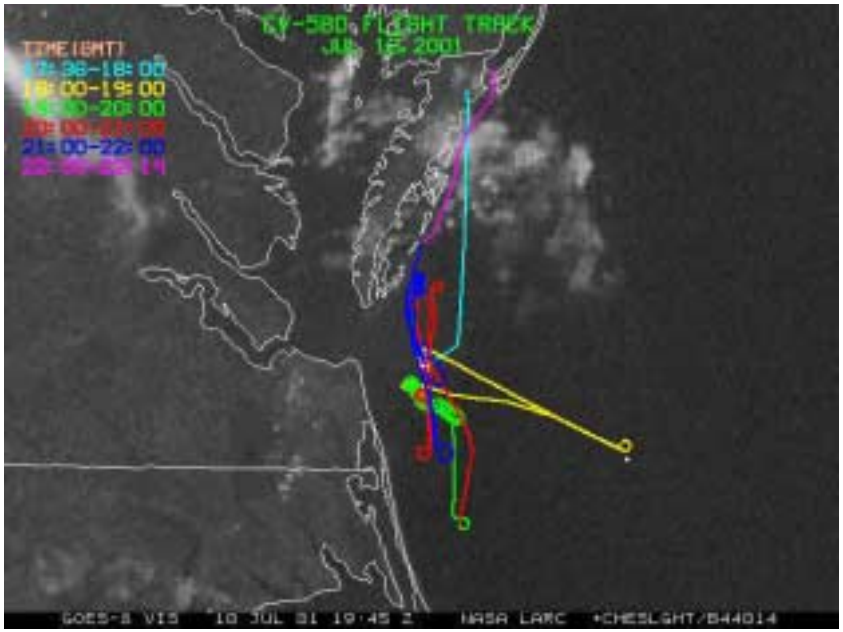
ReLAPS Surface Winds (m/s)

18hr forecast valid 18UTC



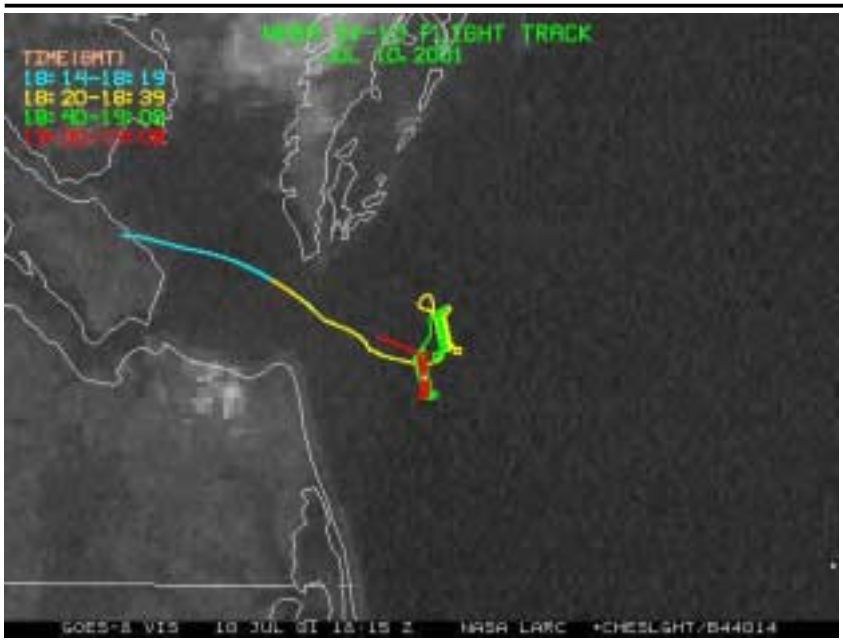


CLAMS: July 10, 2001



CV-580

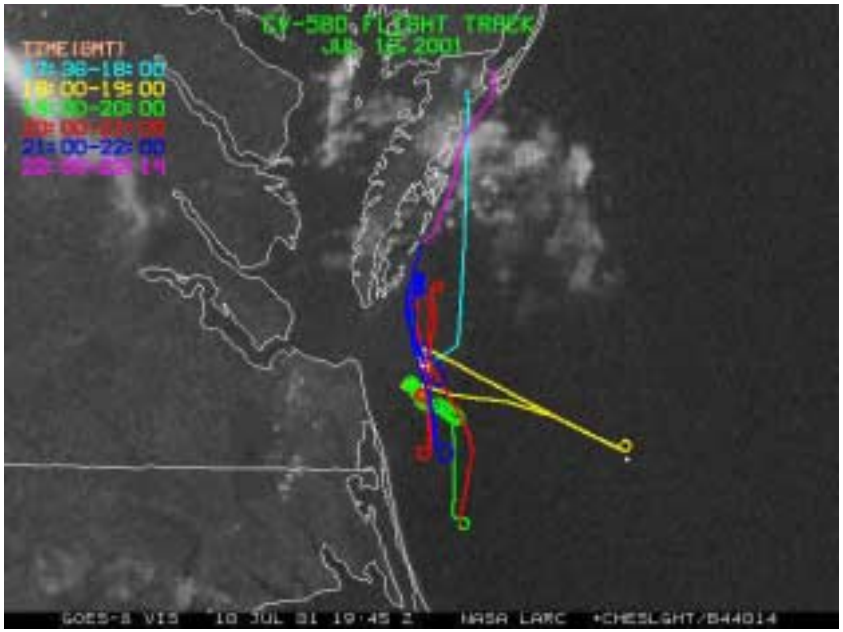
- BRDF near COVE (600ft)
- 30 min AOD run (100ft)
- Slow profile to 12kft
- Aerosol chemistry (10 kft, 4kft)
- BRDF near southern tip Delmarva



OV-10

- Crop-dusters at COVE and nearby NE waypoint to characterize spectral and broadband albedo following CV-580 BRDF

CLAMS: July 10, 2001



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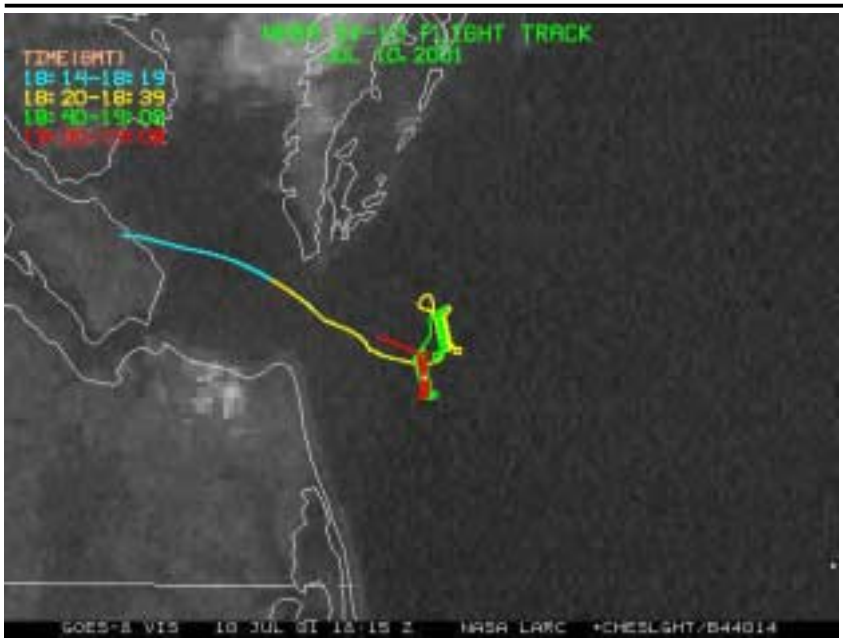

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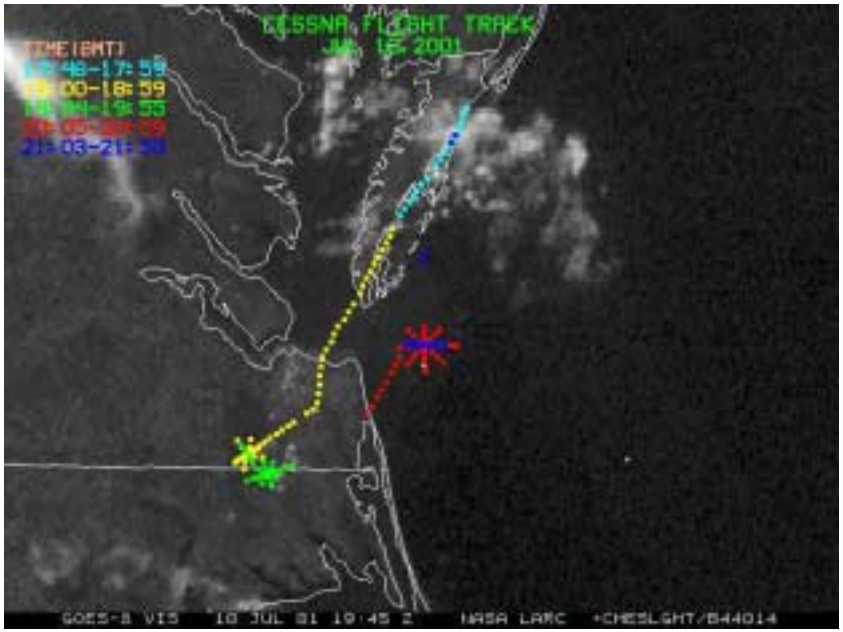
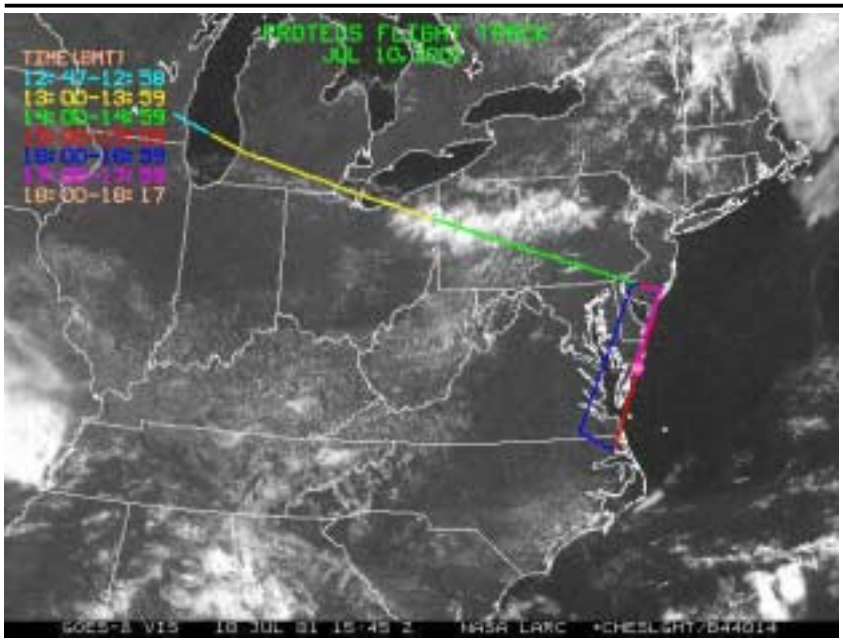


CESSNA

- Rosette pattern over Lake Drummond
- Rosette pattern dismal swamp
- Rosette at COVE (12kft)
- Leg near COVE (200ft)

T/O = 1745 UTC
Land=2205 UTC



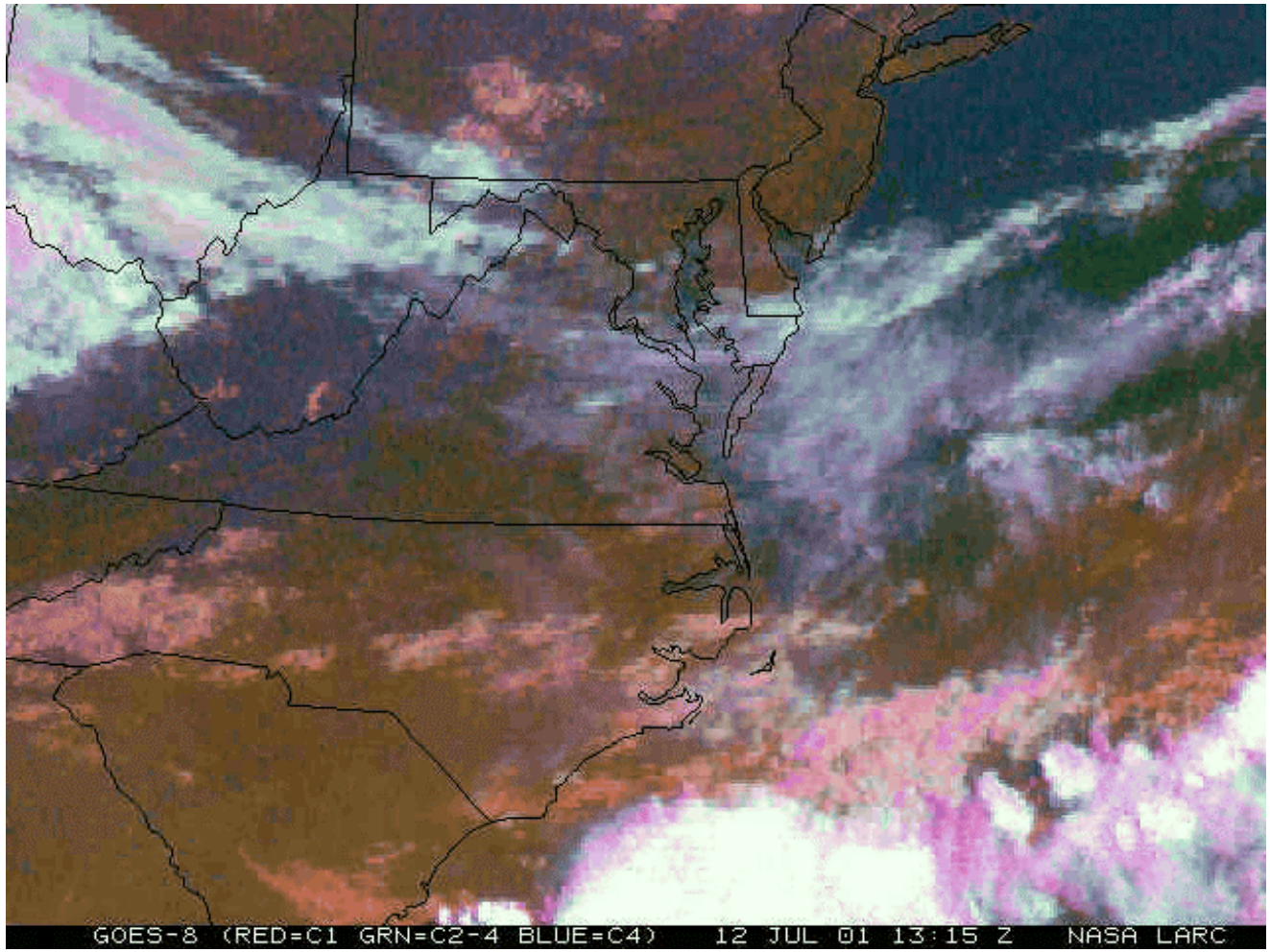
PROTEUS

- Transit from Madison, WI.
- Rectangular mapping pattern at 55kft
- Descending profile east of Wallops
- Land ~1830 UTC

CLAMS: JULY 12, 2001
Satellite

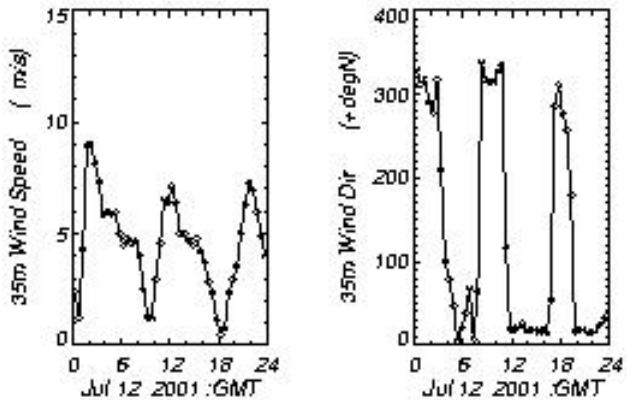
TERRA

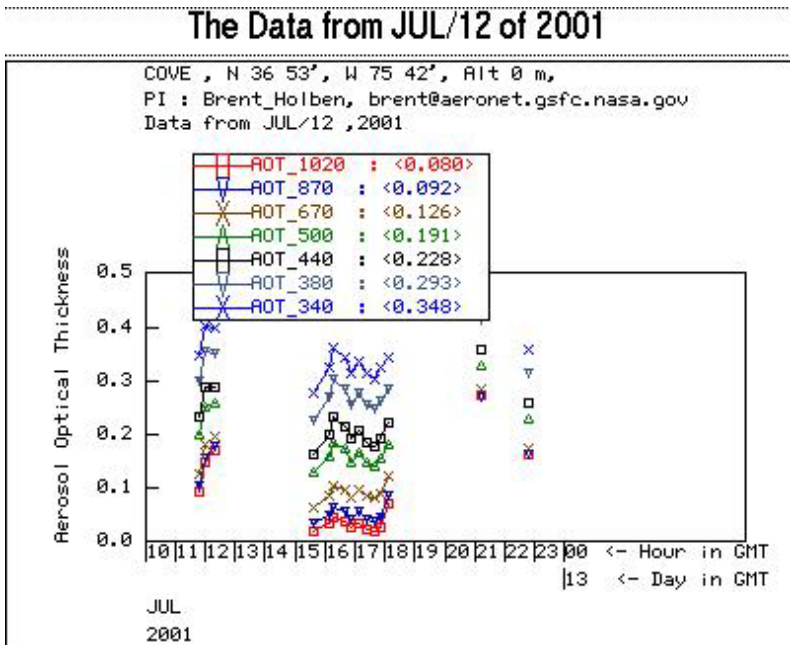
VZA = 54°

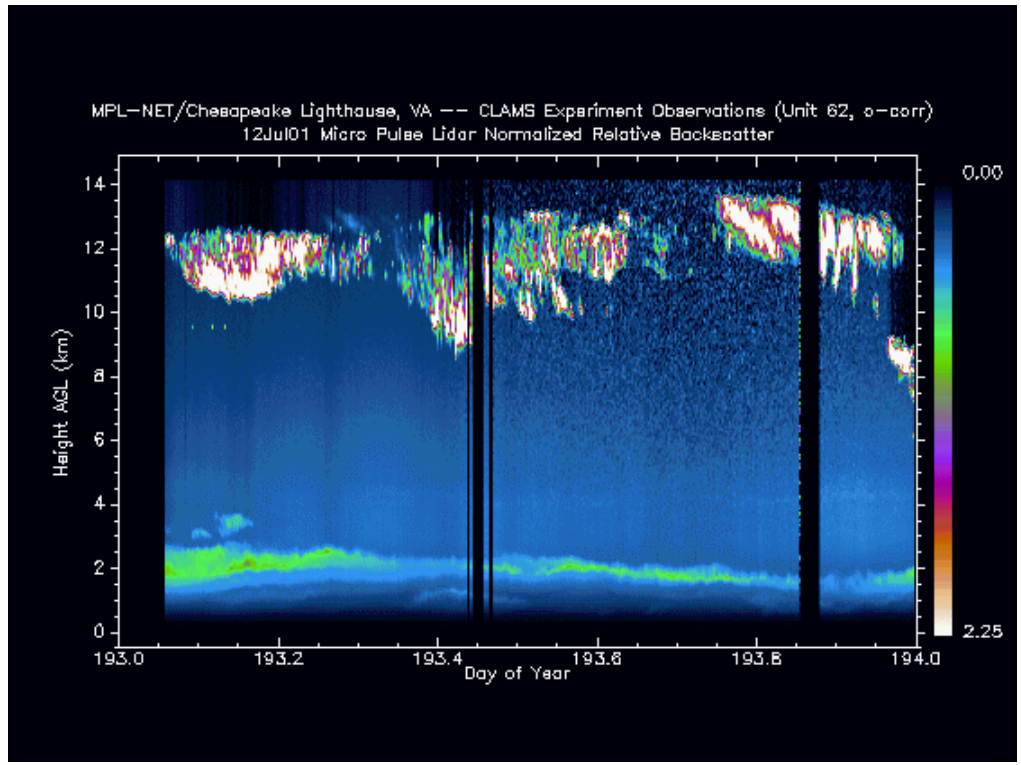


CLAMS: July 12, 2001

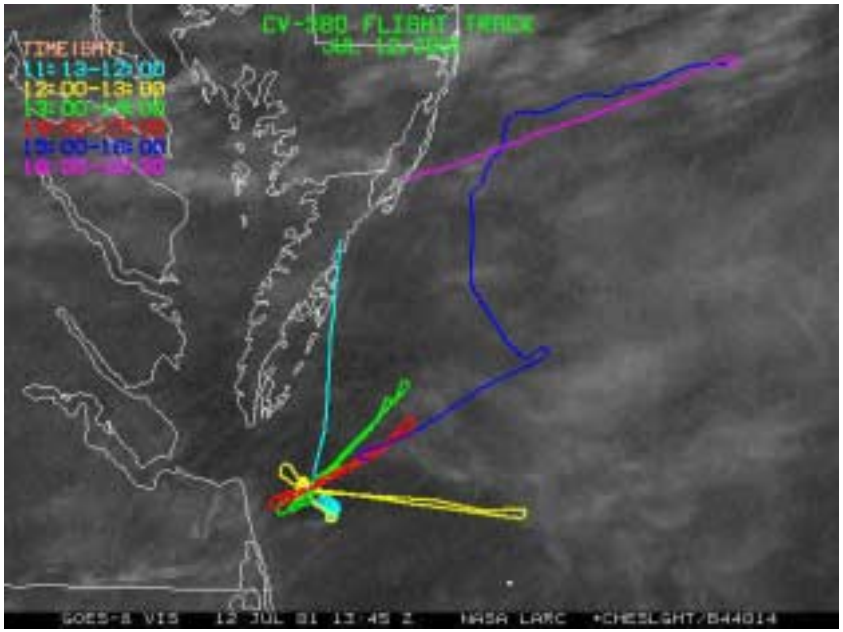
COVE WINDS







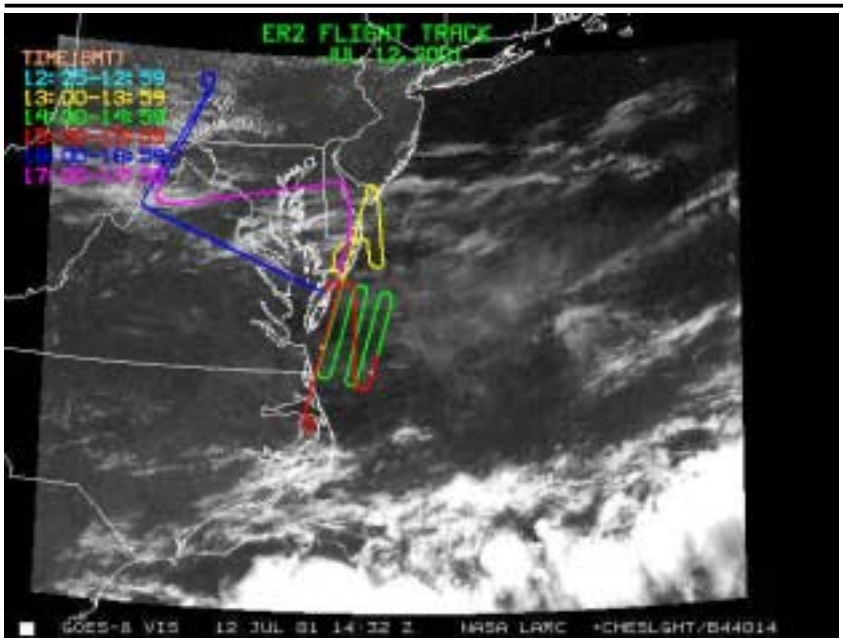
CLAMS: July 12, 2001



CV-580

- Quick profile (6 kft – 100ft)
- BRDF near COVE (clouds)
- Quick ascent to 10kft, slow to 6kft
- Series of cross-wind legs (6, 2.4 and 1.5 kft). Some smoke at end of 2.4 kft leg
- 100 ft AOD run (clear patch) @ TERRA overpass

T/O = 1110 UTC
Land=1635 UTC

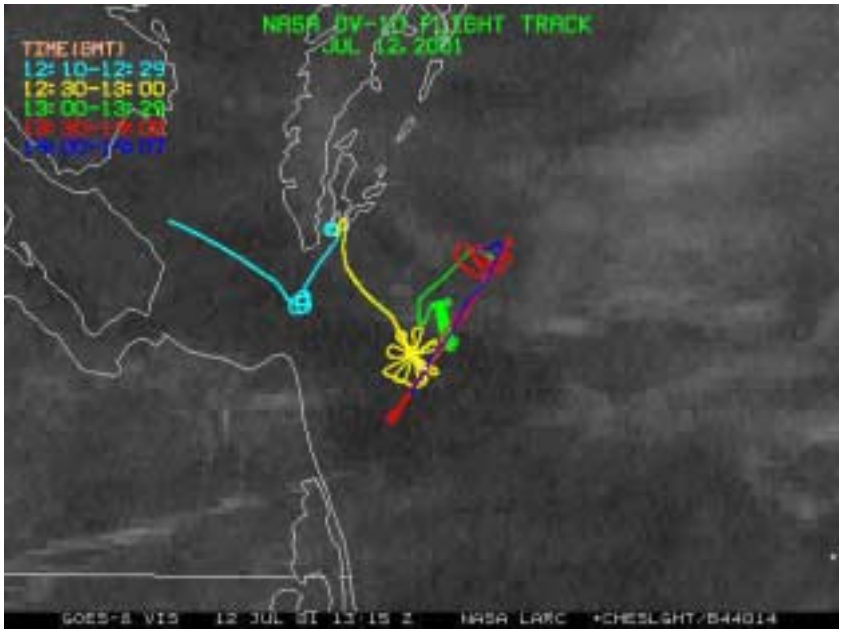


ER-2

- Glint pattern
- Leg parallel to TERRA track over COVE

T/O = 1315 UTC
Land=1751 UTC

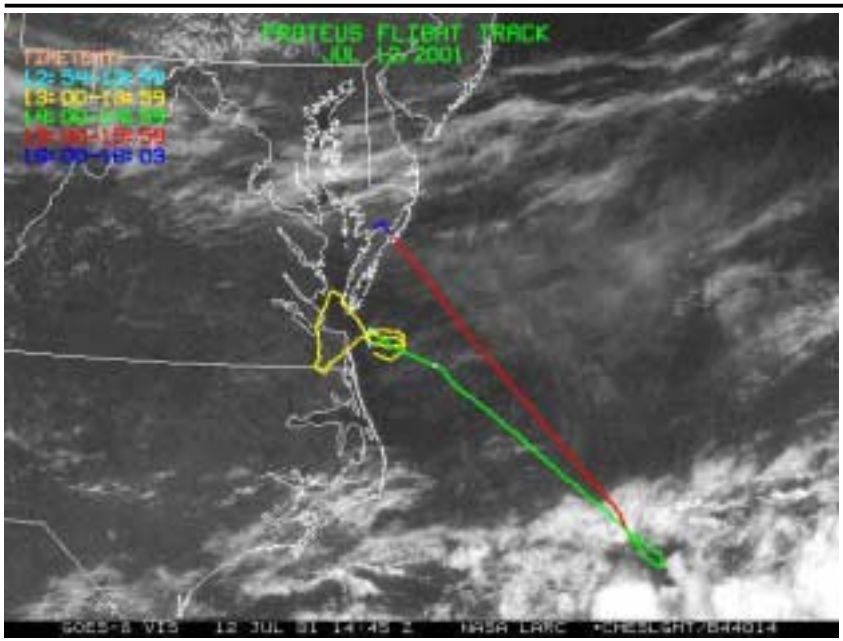
CLAMS: July 12, 2001



OV-10

- 600ft daisy (COVE)
- 600 ft cropduster (NE waypoint)
- NE/SW legs at 3 & 6 kft

T/O = 1205 UTC
Land=1420 UTC



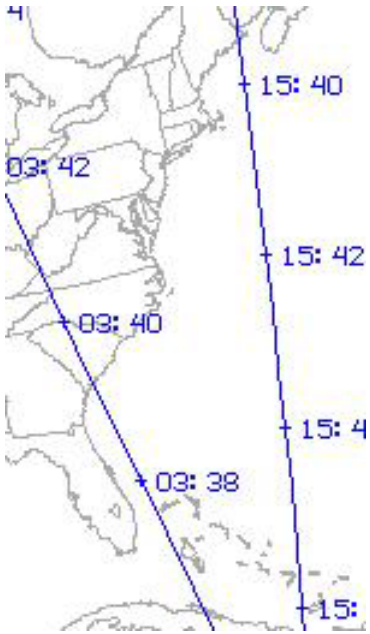
PROTEUS

- Ascending profile over COVE (2-55 kft)
- 55kft leg to Buoy 41001 and back

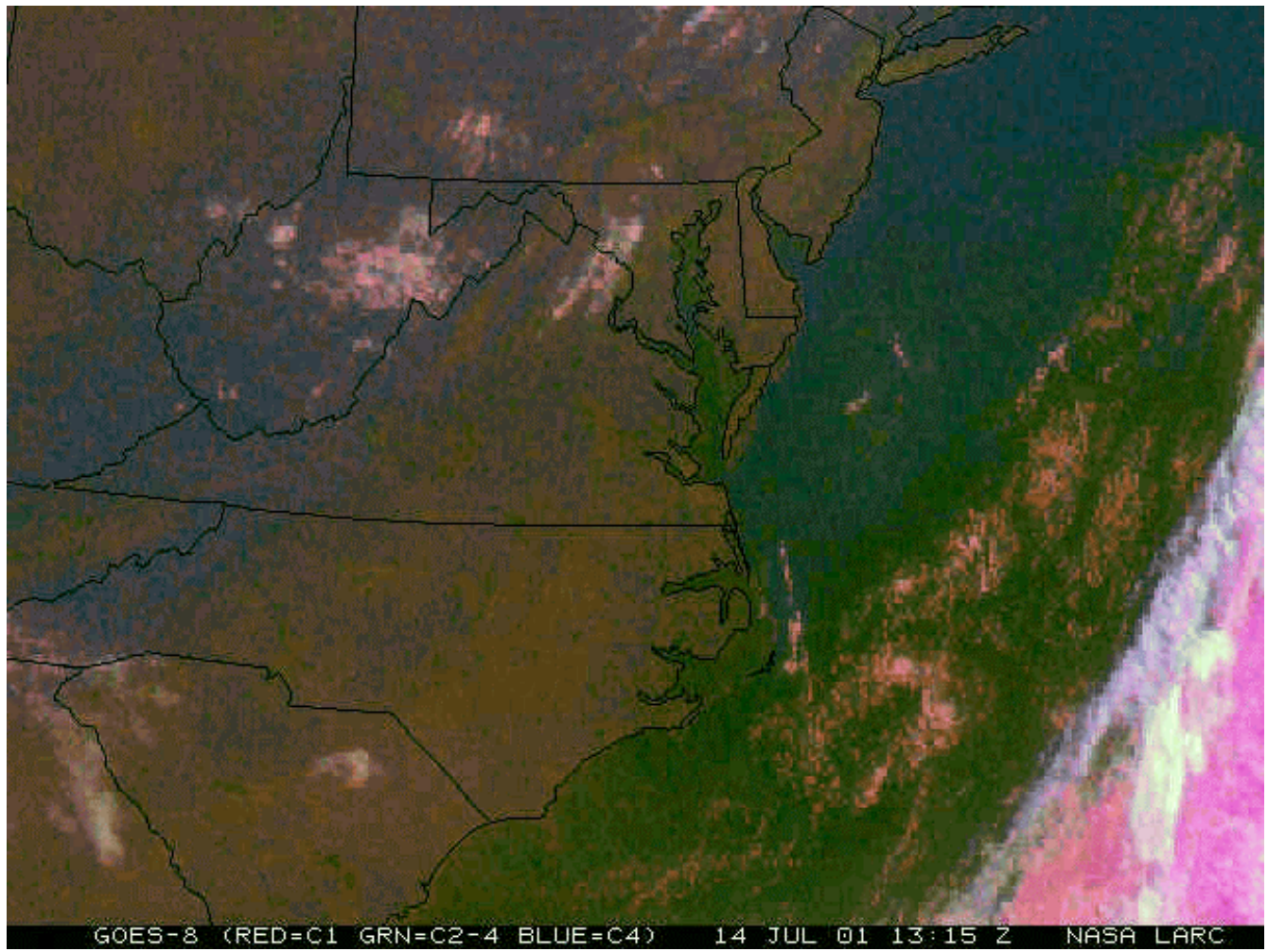
T/O = 1133 UTC
Land=1639 UTC

CLAMS: JULY 14, 2001
Satellite

TERRA

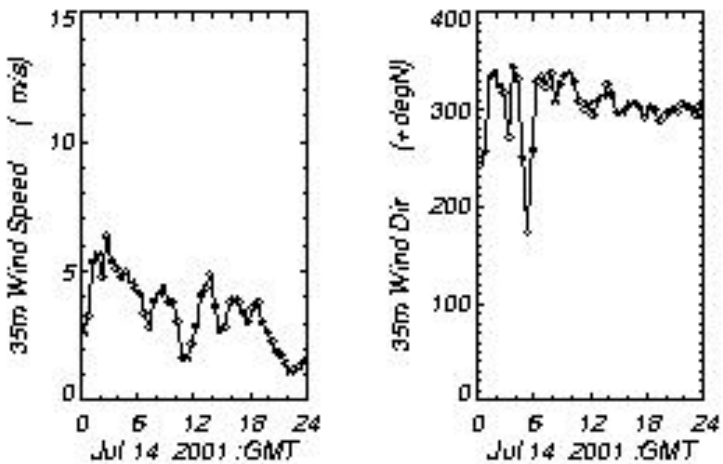


VZA = 41°

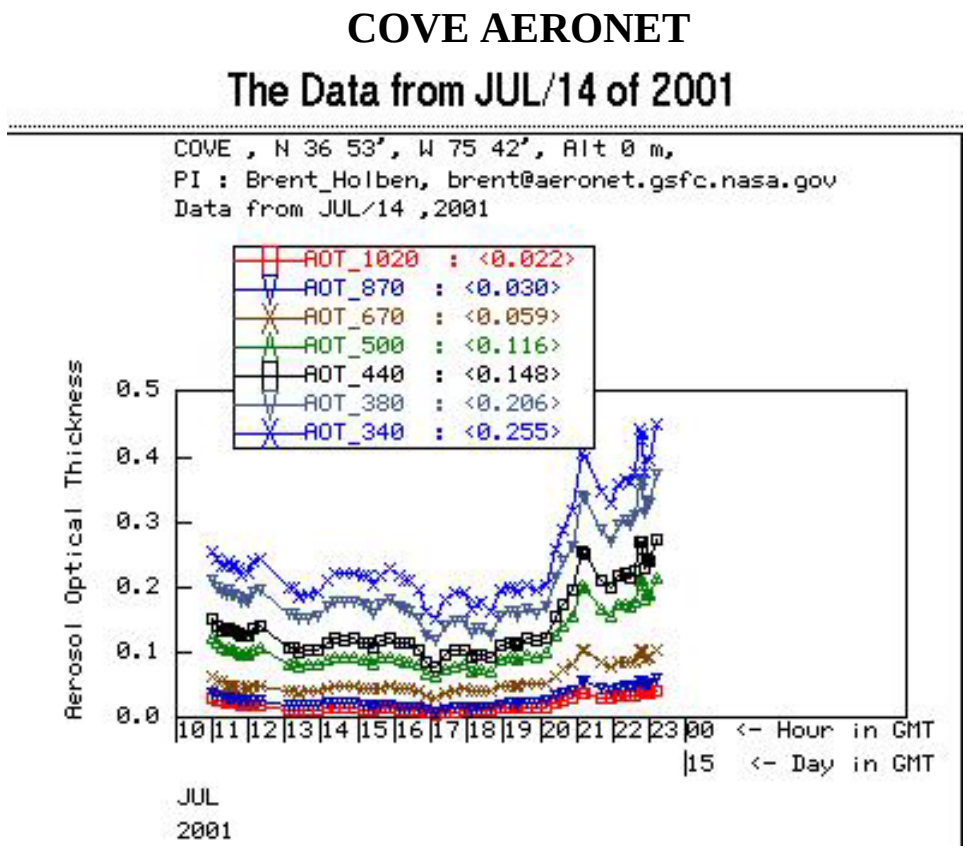


CLAMS: July 14, 2001

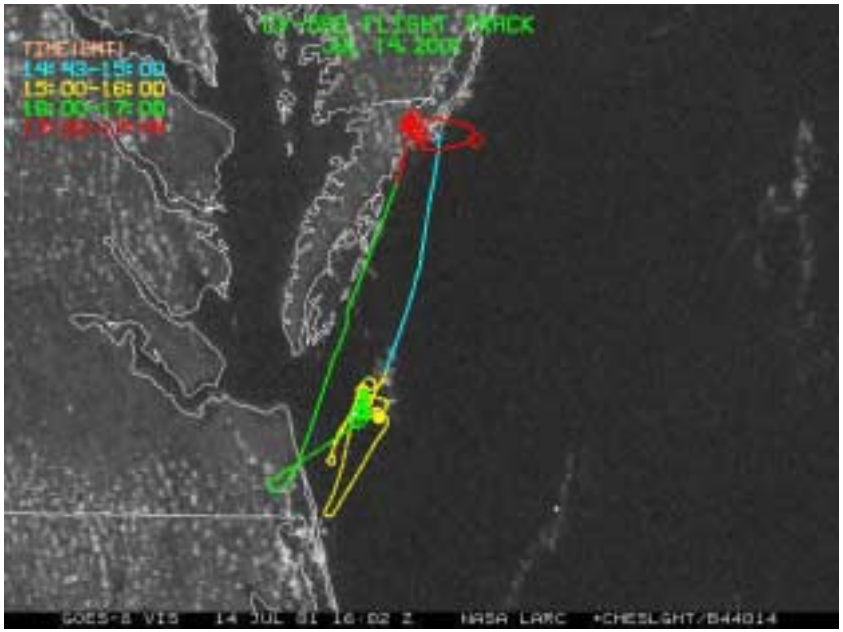
COVE WINDS



COVE AERONET



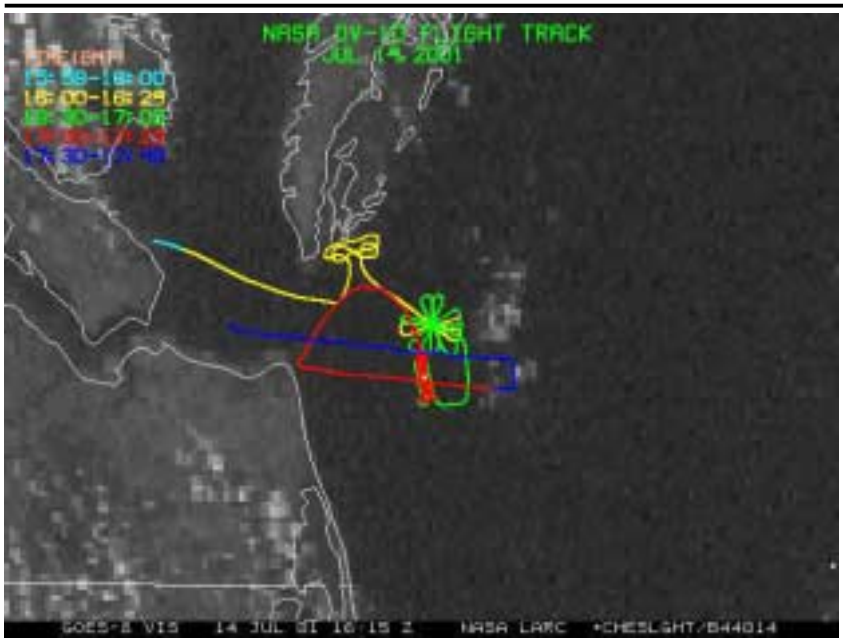
CLAMS: July 14, 2001



CV-580

- Slow profile over COVE (10kft - 100 ft)
- 100 ft AOD run @TERRA overpass
- BRDF near COVE (some clouds)
- Transit to Dismal swamp/abort due clouds
- Radiosonde chase to 12 kft (Wallops)

T/O = 1440 UTC
Land=1745 UTC

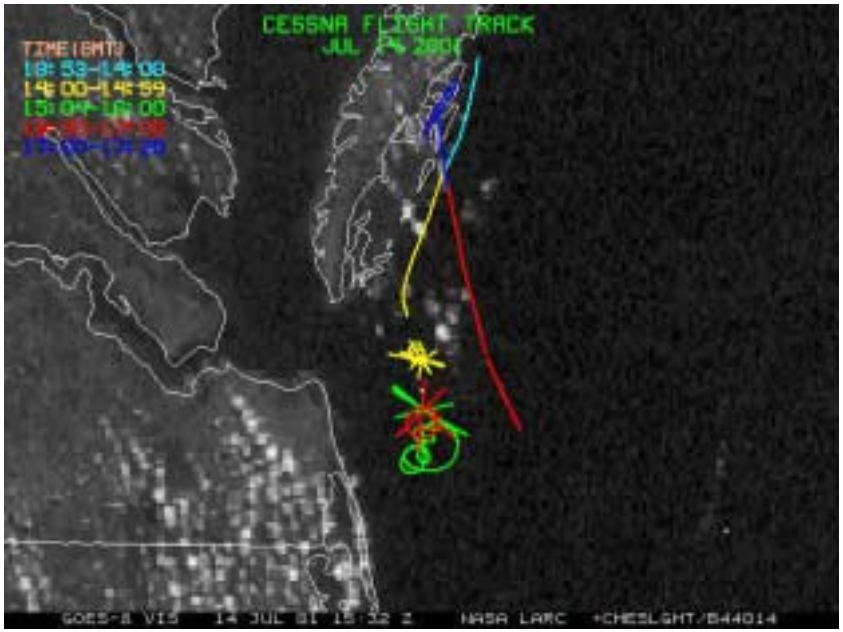


OV-10

- look for oil spill
- COVE crop-duster
- Daisy NE waypoint
- Series of east west legs (600 ft)

T/O = 1555 UTC
Land=1750 UTC

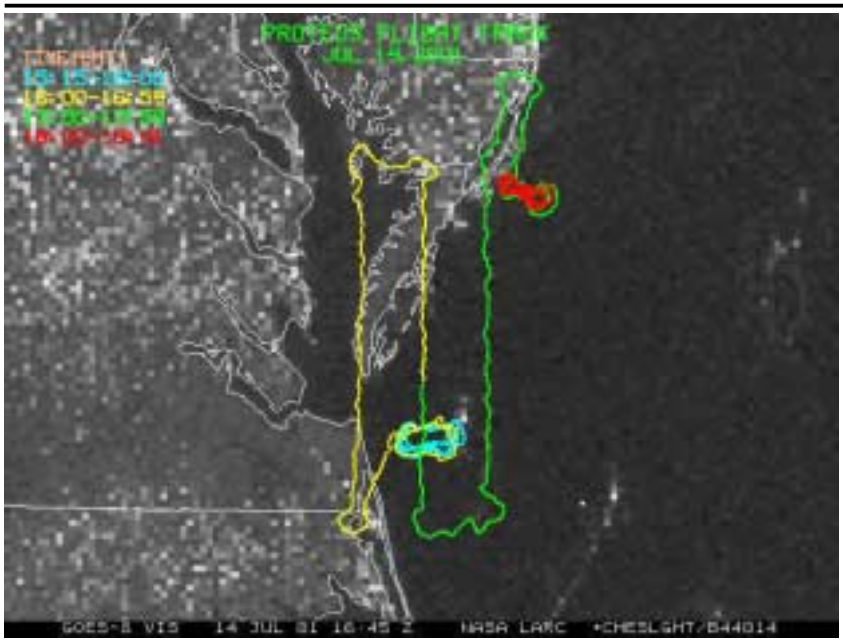
CLAMS: July 14, 2001



CESSNA

- spiral north of COVE (2kft –12kft)
- rosette (12 kft) north
- COVE rosette at TERRA overpass

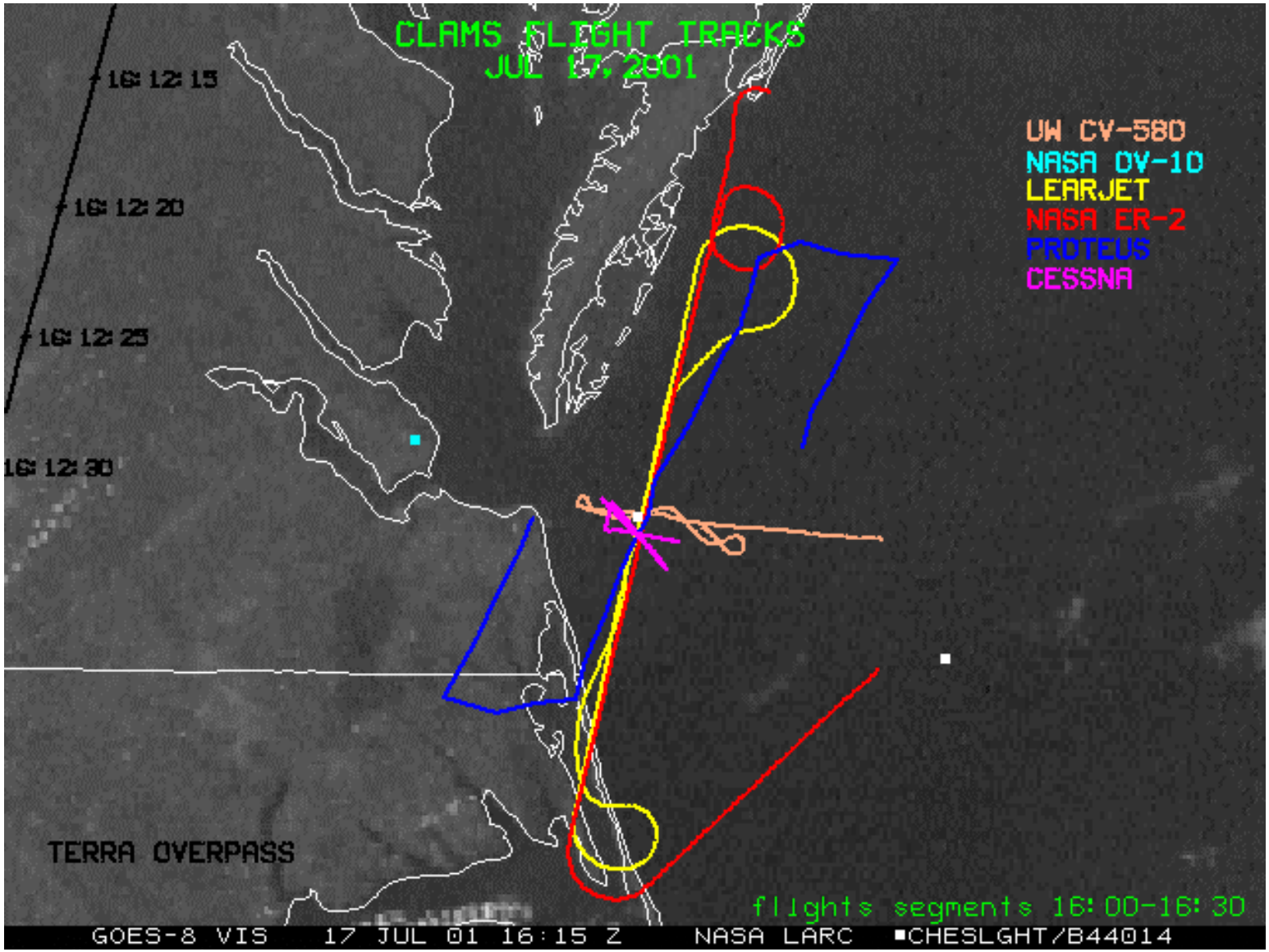
T/O = 1345 UTC
Land=1730 UTC



PROTEUS

- COVE profile (2-55 kft)
- Mapping pattern (55 kft)
- Wallops Profile (55-2 kft)

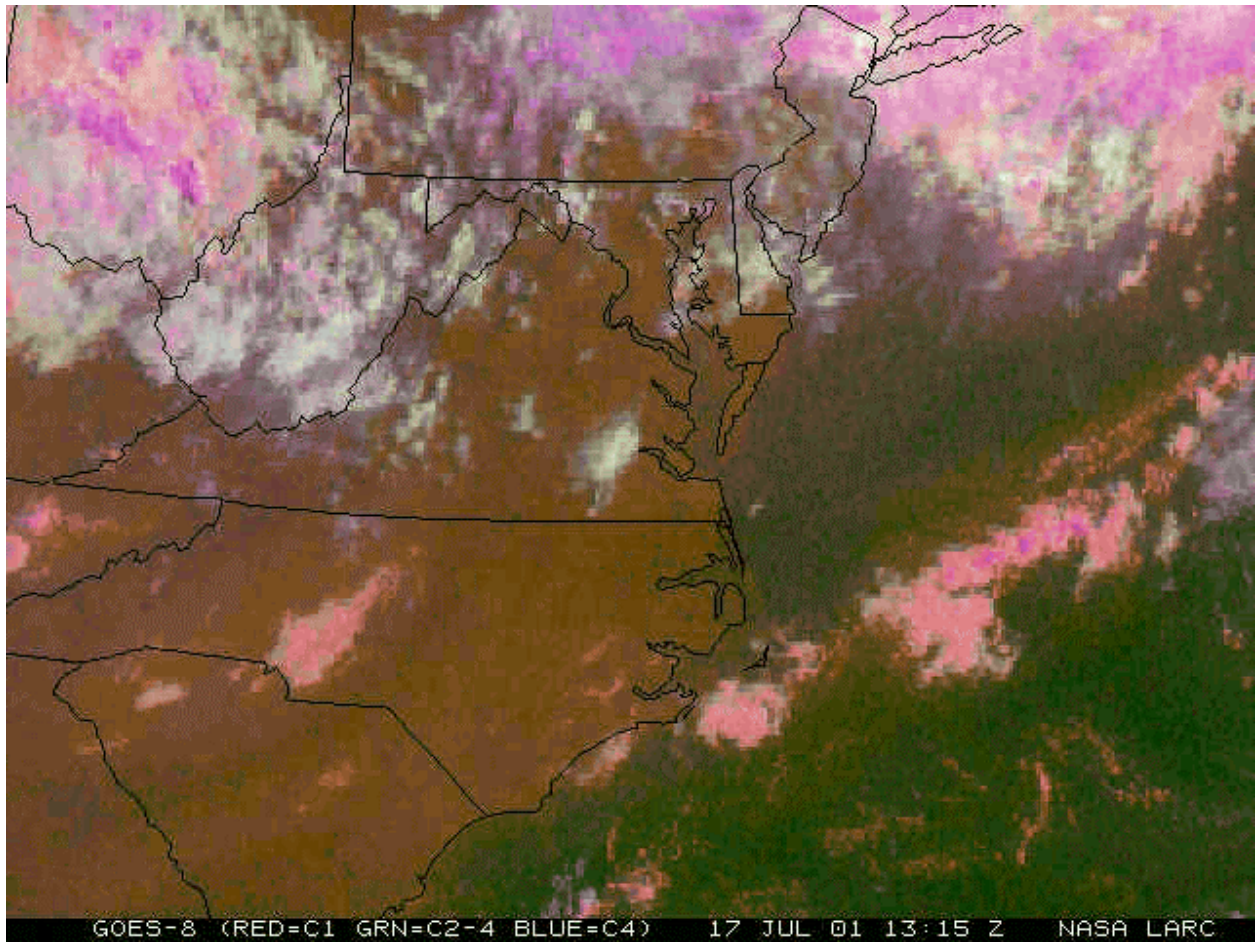
T/O = 1415 UTC
Land=1850 UTC


CLAMS FLIGHT TRACKS
JUL 17, 2001
16:12:15
16:12:20
16:12:25
16:12:30
UW CV-580
NASA OV-10
LEARJET
NASA ER-2
PROTEUS
CESSNA
TERRA OVERPASS
flights segments 16:00-16:30
GOES-8 VIS 17 JUL 01 16:15 Z NASA LARC CHESLGHT/B44014

CLAMS: JULY 17, 2001
Satellite

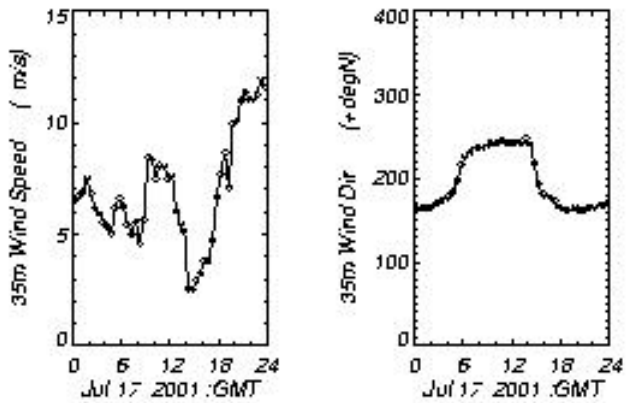
TERRA

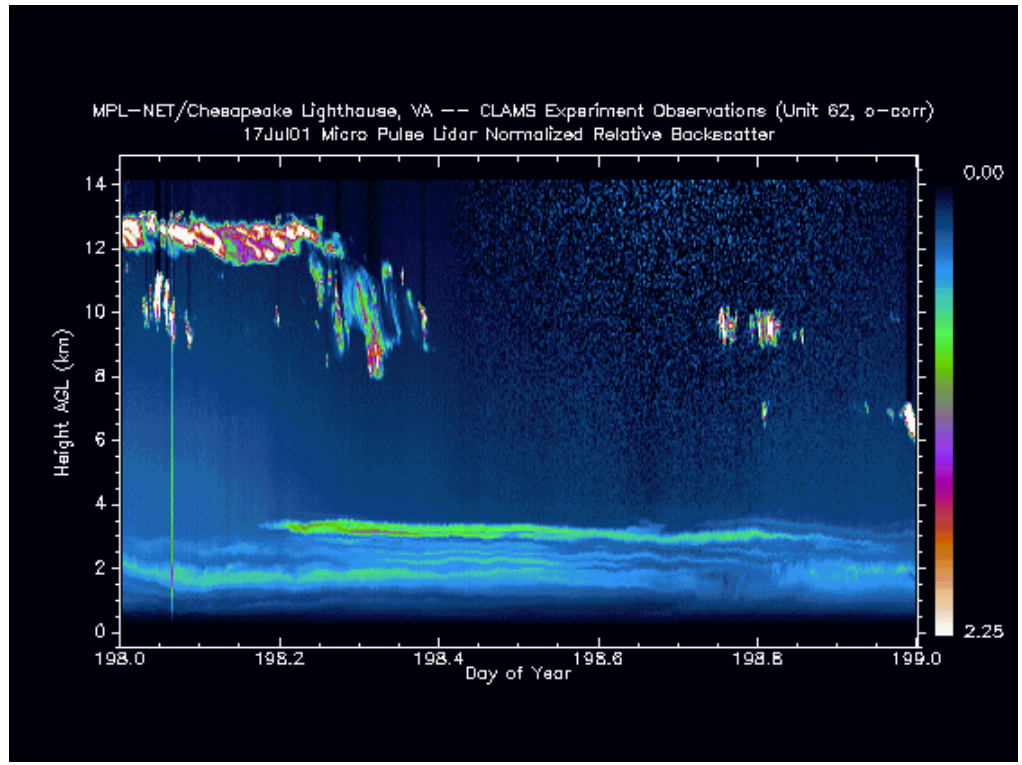
VZA = 14°



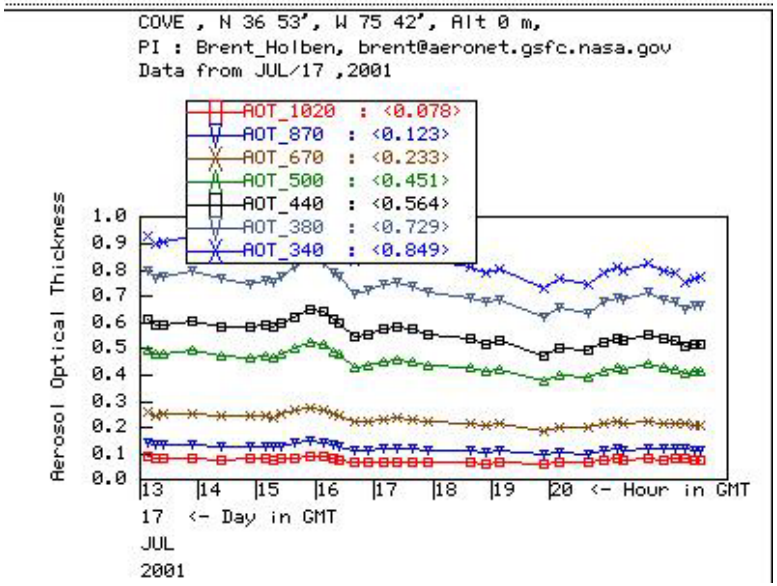
CLAMS: July 17, 2001

COVE WINDS

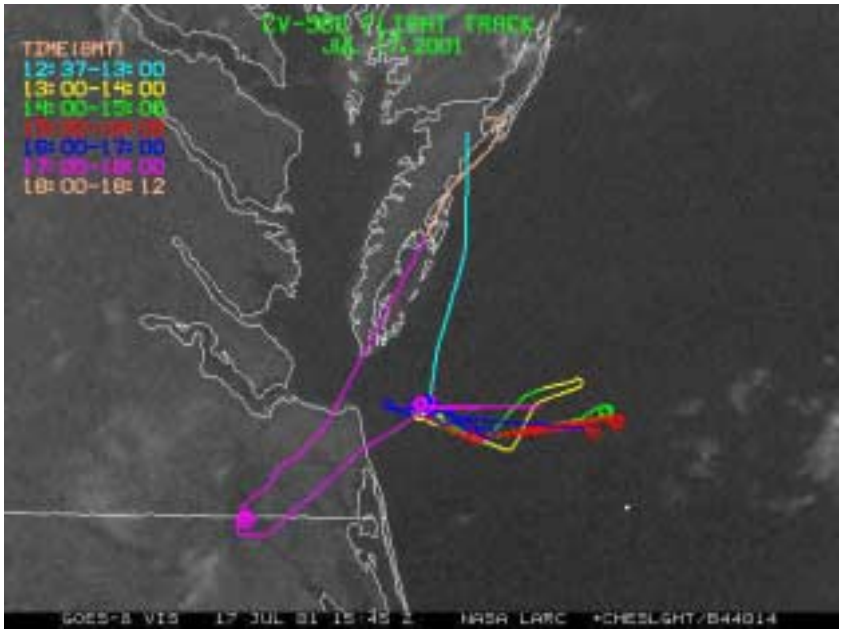




The Data from JUL/17 of 2001



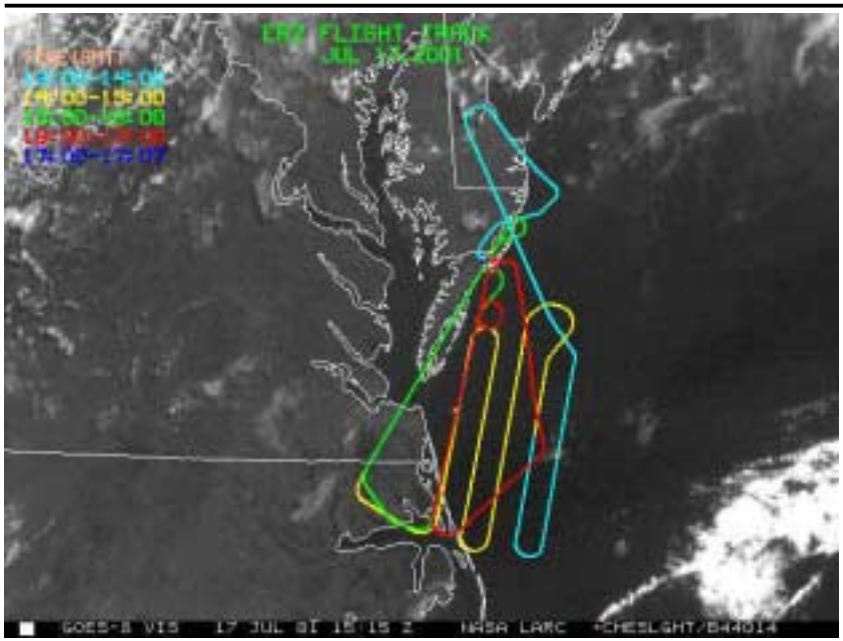
CLAMS: July 17, 2001



CV-580

- slow profile over COVE (100 ft – 11kft)
- Aerosol chemistry@ 9, 6, 3 kft (L-pattern)
- 100 ft AOD run (west to east)
- BRDF near COVE
- tried Dismal again – clouds

T/O = 1235 UTC
Land=1812 UTC

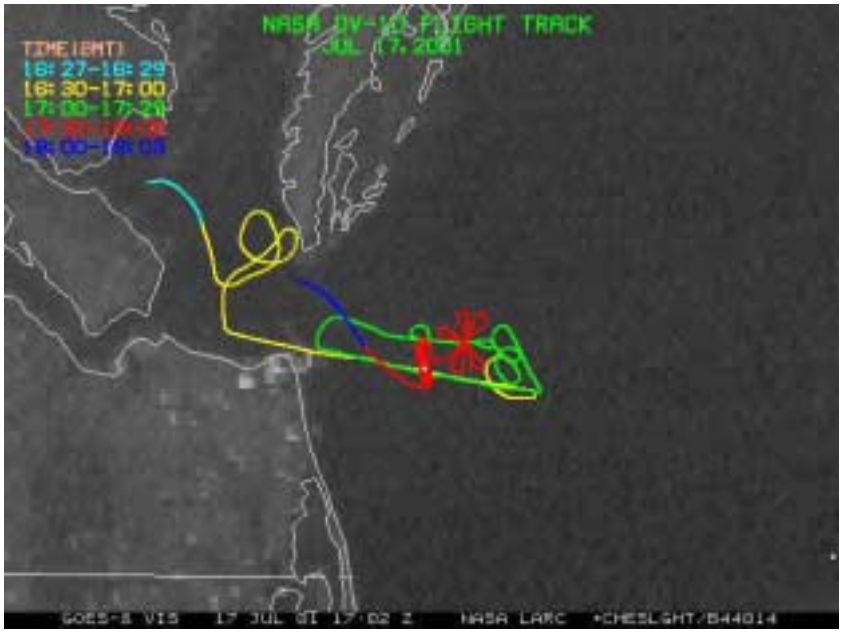


ER-2

- Glint pattern
- Geo-Cal
- COVE track (parallel to TERRA); airMISR nine angle mode
- Track to 44014

T/O = 1300 UTC
Land=1701 UTC

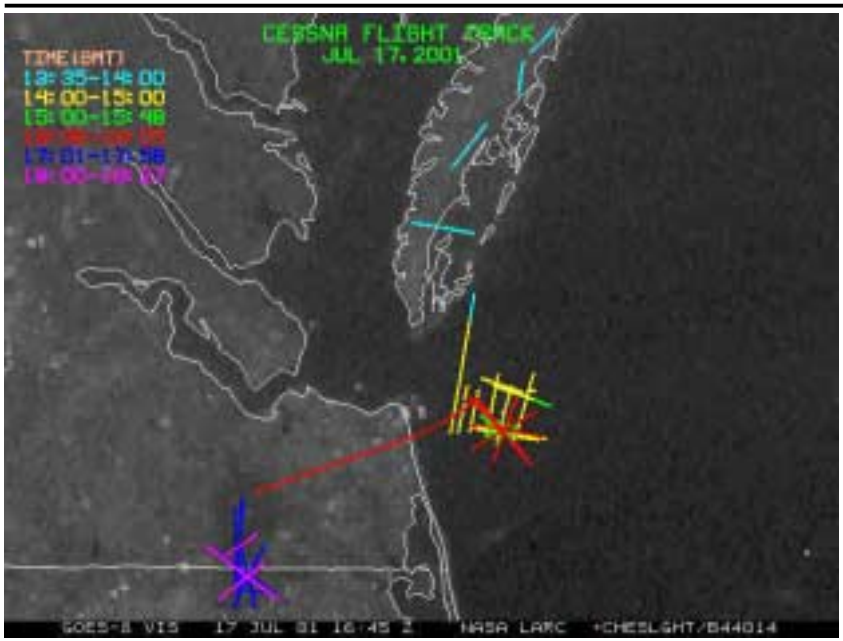
CLAMS: July 17, 2001



OV-10

- 10 kft leg mouth of bay to east of COVE
- 3 kft reverse leg
- 600 ft daisy at NE waypoint
- 600 ft crop-duster over COVE
- 600 ft tack se to nw COVE to bay bridge

T/O = 1623 UTC
Land=1812 UTC

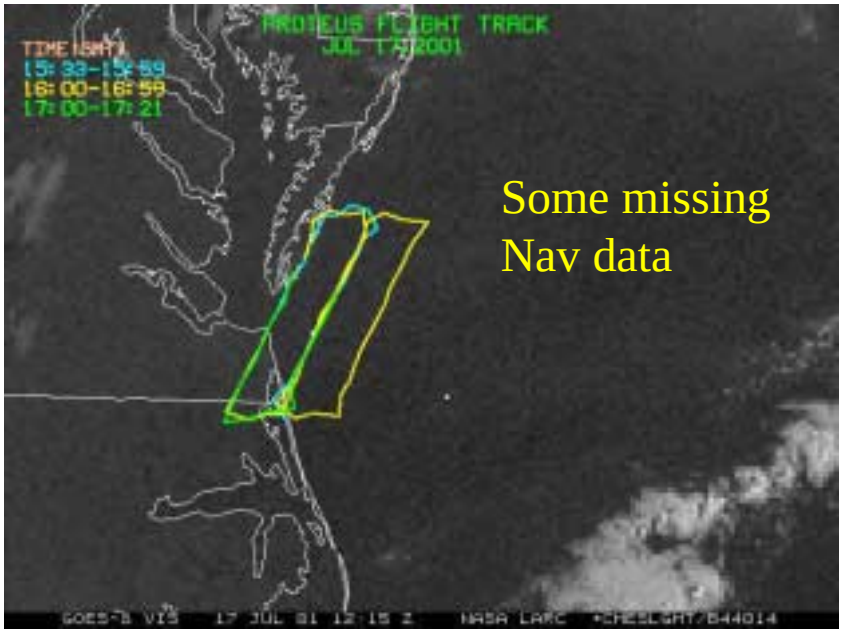


CESSNA

- 12kft crop-duster (PP) , tracks 90^{o} toPP
- 200 ft rosette
- 12 kft rosette
- Dismal swamp tracks

T/O = 1330 UTC
Land=1800UTC

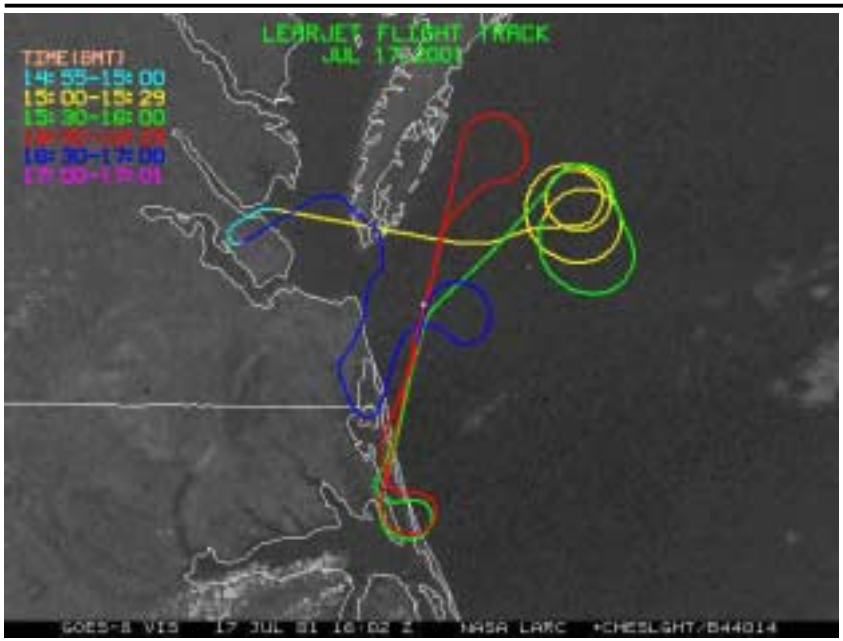
CLAMS: July 17, 2001



PROTEUS

- COVE profile (2-55 kft)
- Mapping pattern (55 kft)
- Wallops Profile (55-2 kft)

T/O = 1431 UTC
Land=1832 UTC



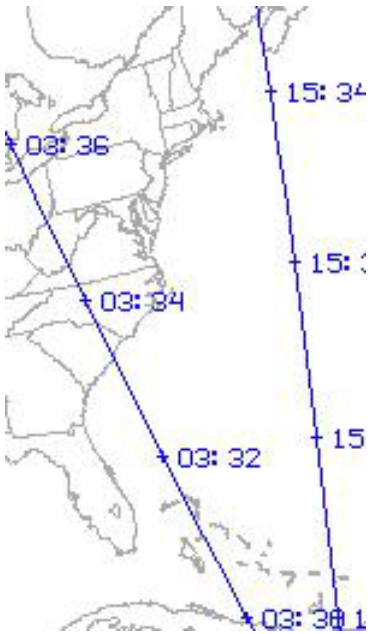
Lear Jet

- Tracks at 40 kft parallel toTERRA overpass with LAABS (A-band)

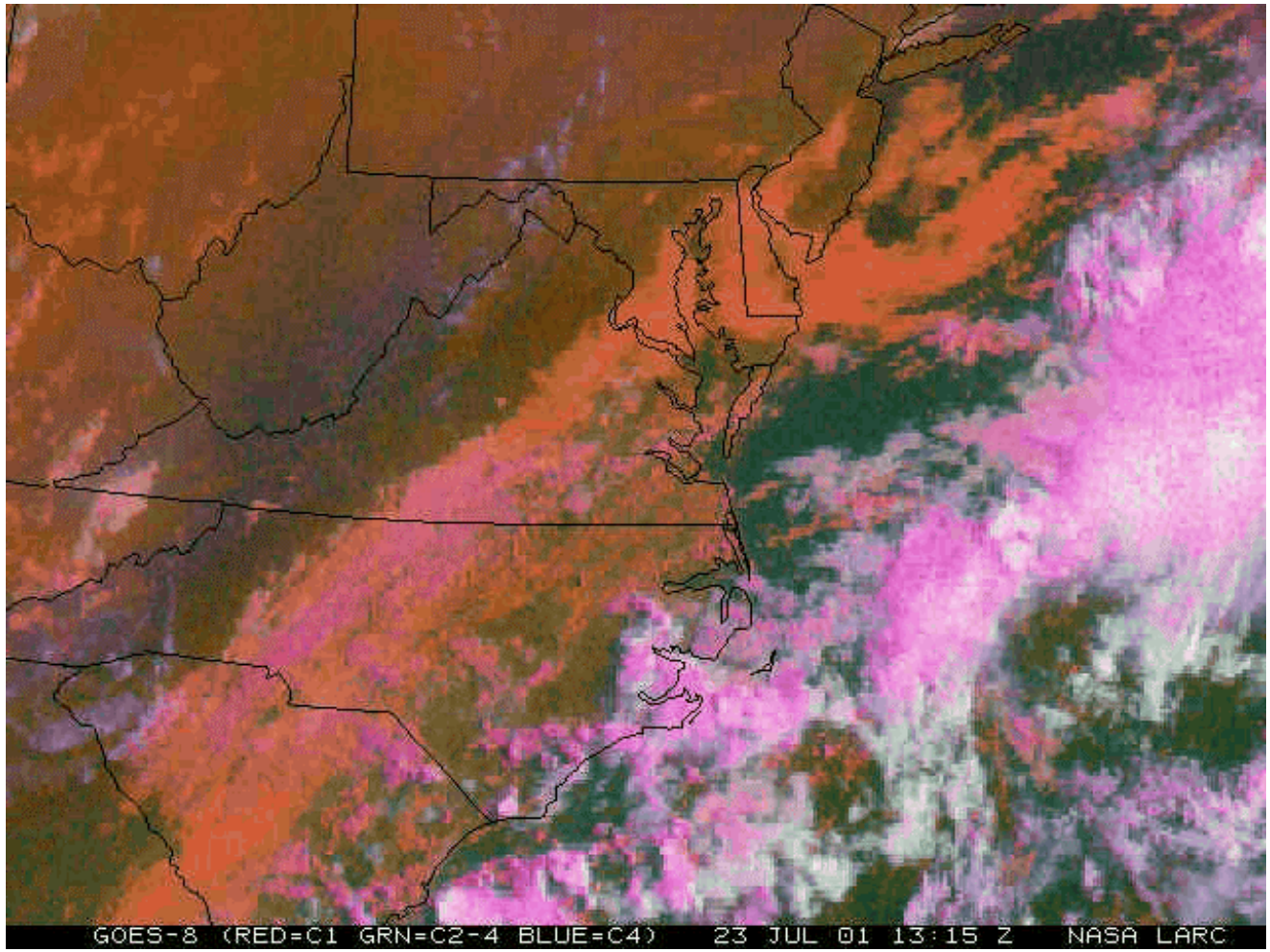
T/O = 1500 UTC
Land=1800 UTC

CLAMS: JULY 23, 2001
Satellite

TERRA

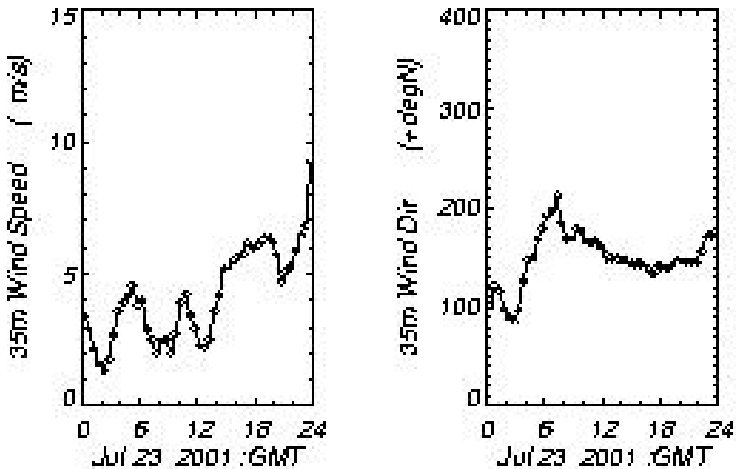


VZA = 47°

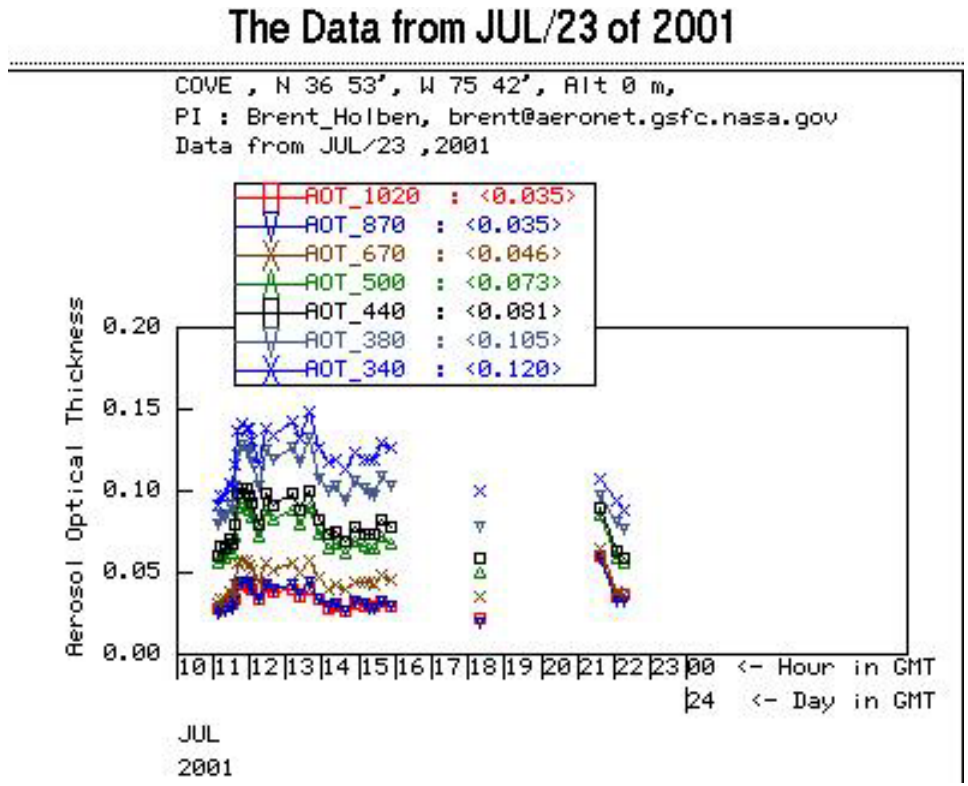


CLAMS: July 23, 2001

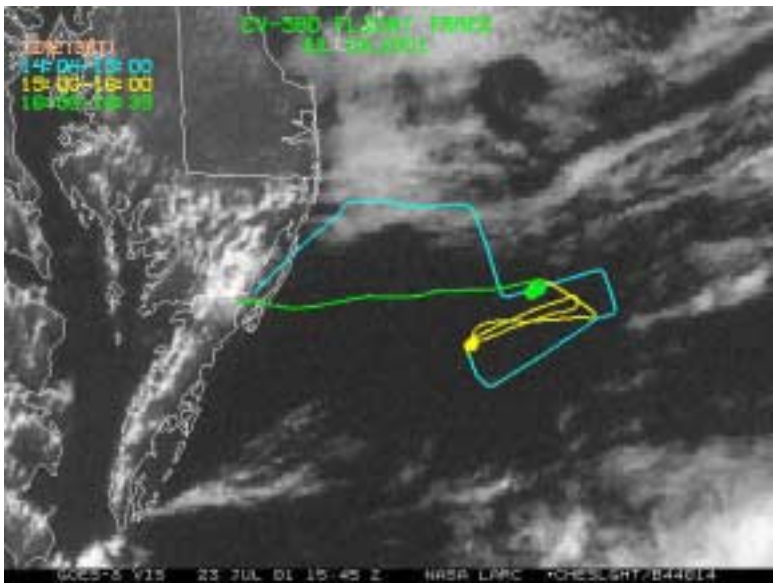
COVE WINDS



COVE AERONET



CLAMS: July 23, 2001



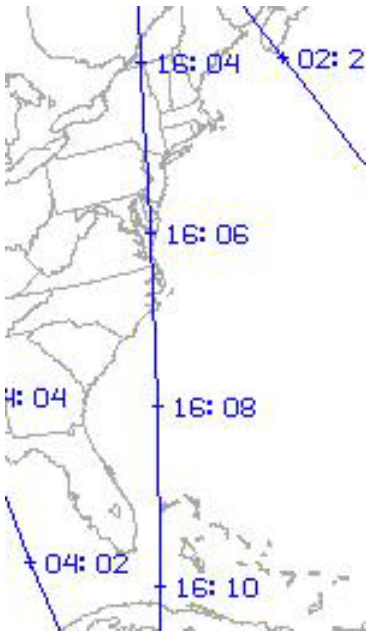
CV-580

- BRDF 70 mi east of Wallops
- 100 ft AOD run (~25 nmi legs) - TERRA
- Profile to 10 kft

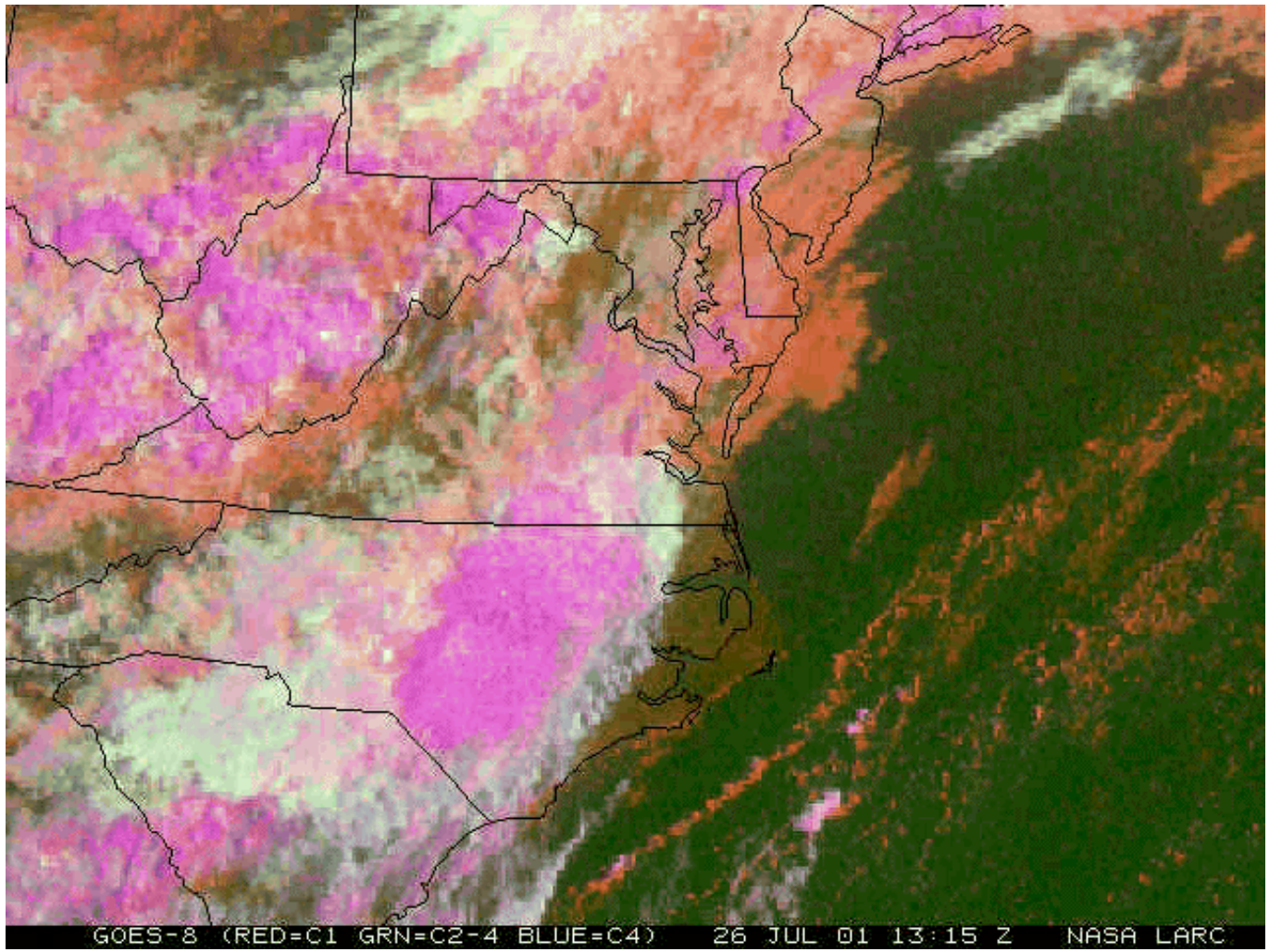
T/O = 1402 UTC
Land=1639 UTC

CLAMS: JULY 26, 2001
Satellite

TERRA

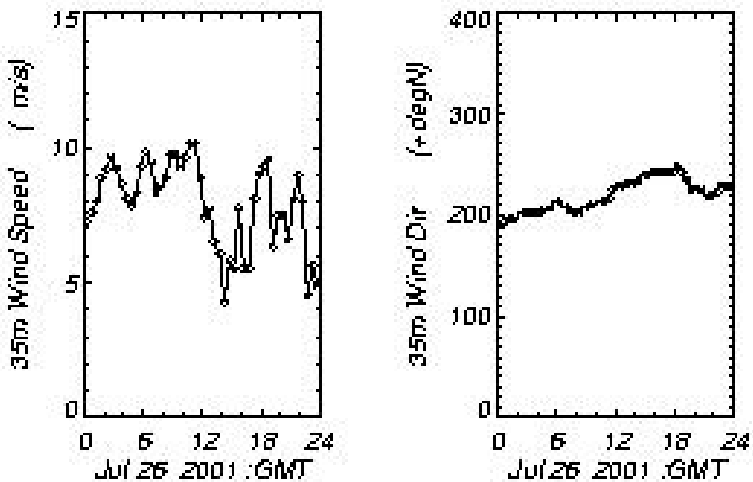


VZA = 3°

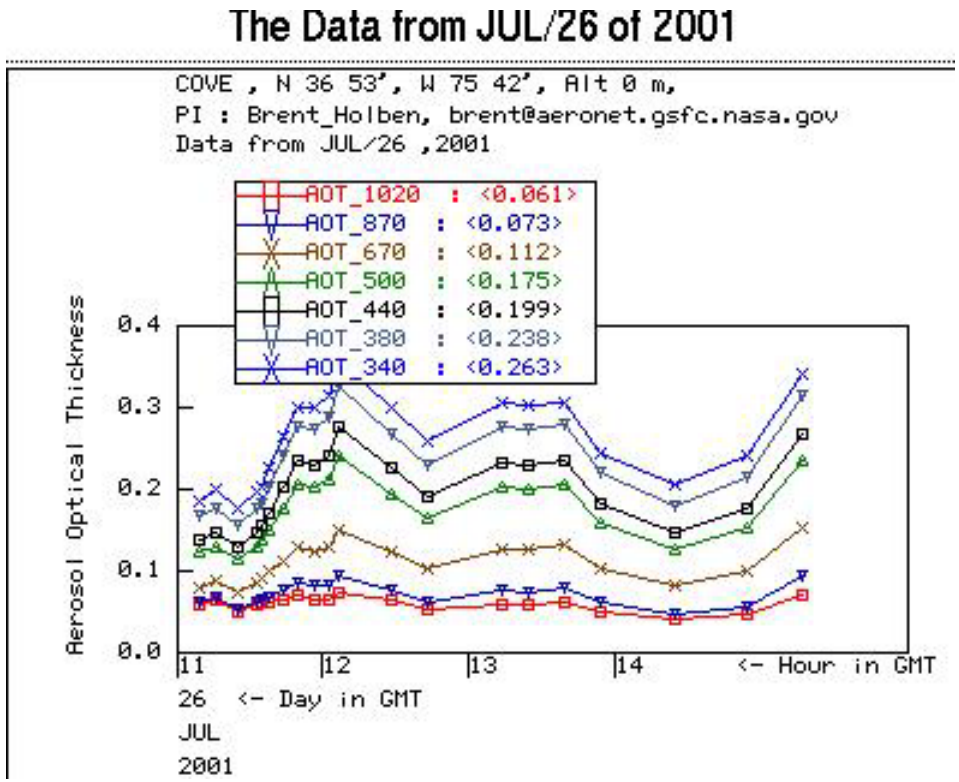


CLAMS: July 26, 2001

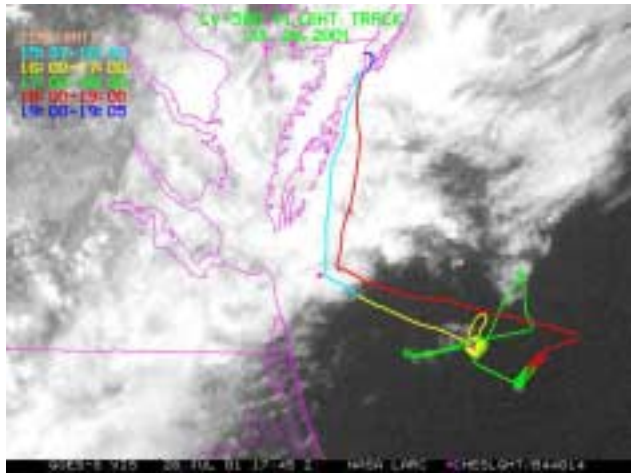
COVE WINDS



COVE AERONET



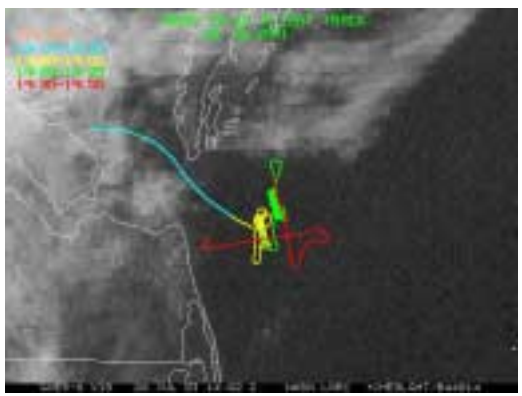
CLAMS: July 26, 2001



CV-580

- 100 ft AOD run (COVE to 44014) – TERRA overpass
- Slow profile to 10kft
- Quick profile down to 100 ft
- Aerosol chemistry at 2.2 kft
- BRDF near 44014
- 100 ft AOD run near buoy
- Chemistry at 2.2 kft and 1.1 kft on transit to Wallops

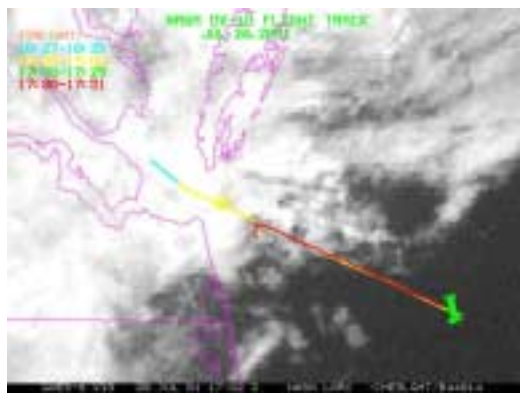
T/O = 1535 UTC
Land=1904 UTC



OV-10 (flt 1)

- 600 ft cropdusters
- 100 ft COVE fly-bys

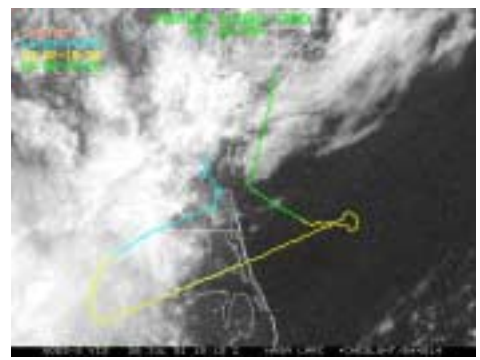
T/O = 1316 UTC
Land=1504 UTC



OV-10 (flt 2)

- 600 ft transit to/from 44014
- 600 ft crop-duster at 44014

T/O = 1316 UTC
Land=1504 UTC



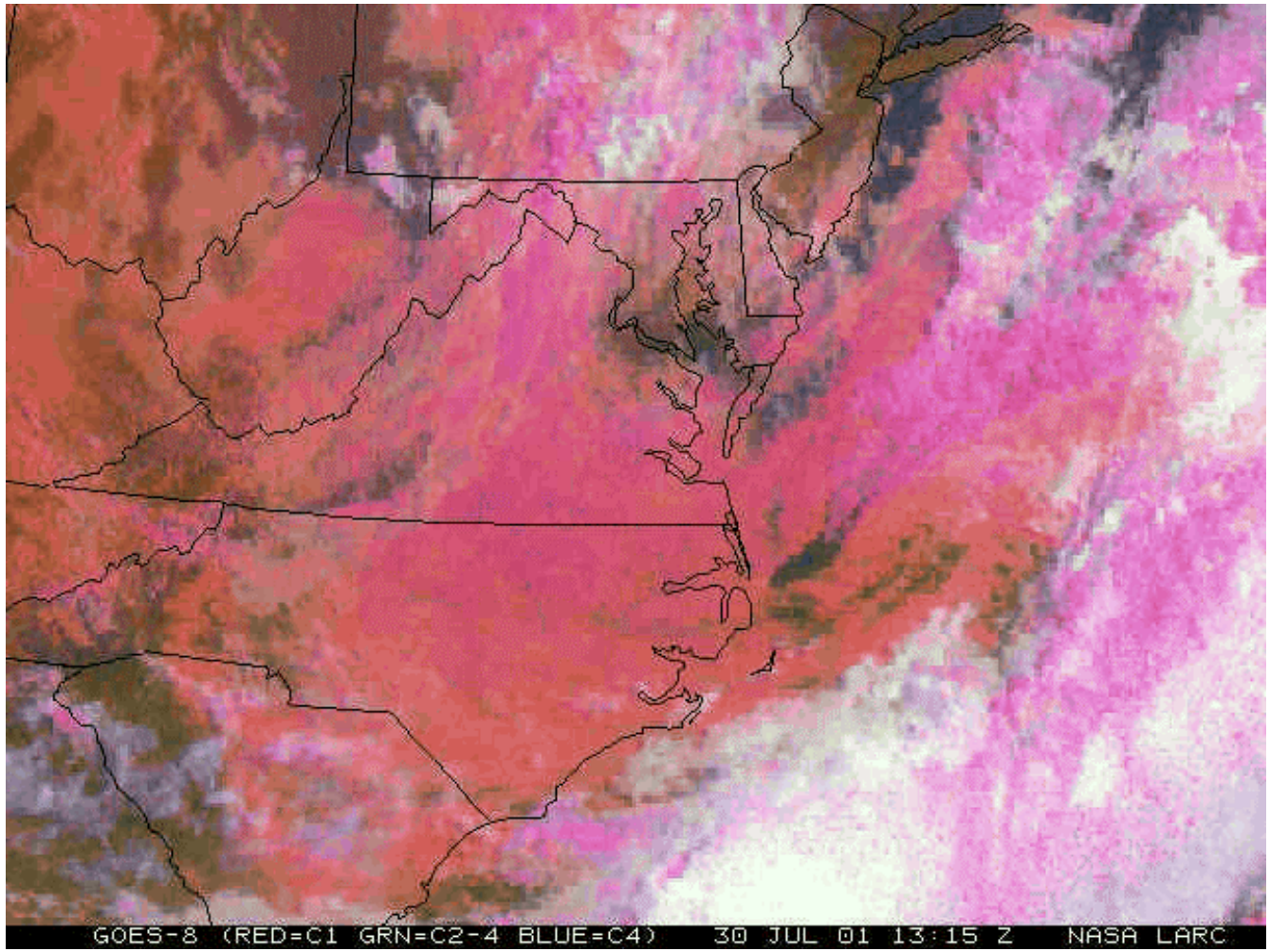
PROTEUS

- Fly by 44014 at 55 kft

CLAMS: JULY 30, 2001
Satellite

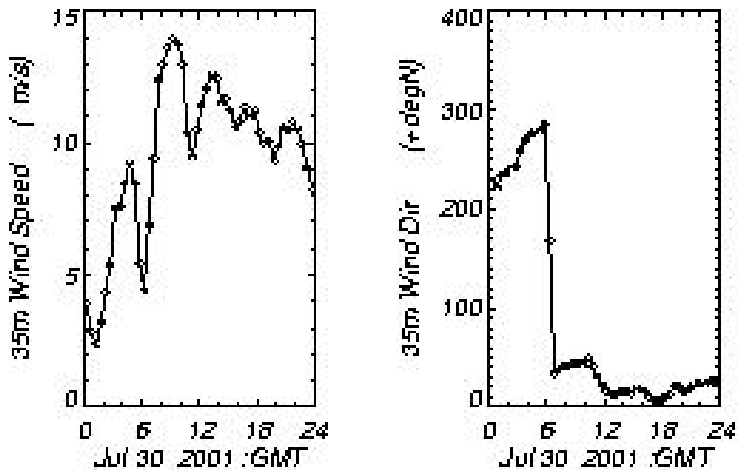
TERRA

VZA = 39°

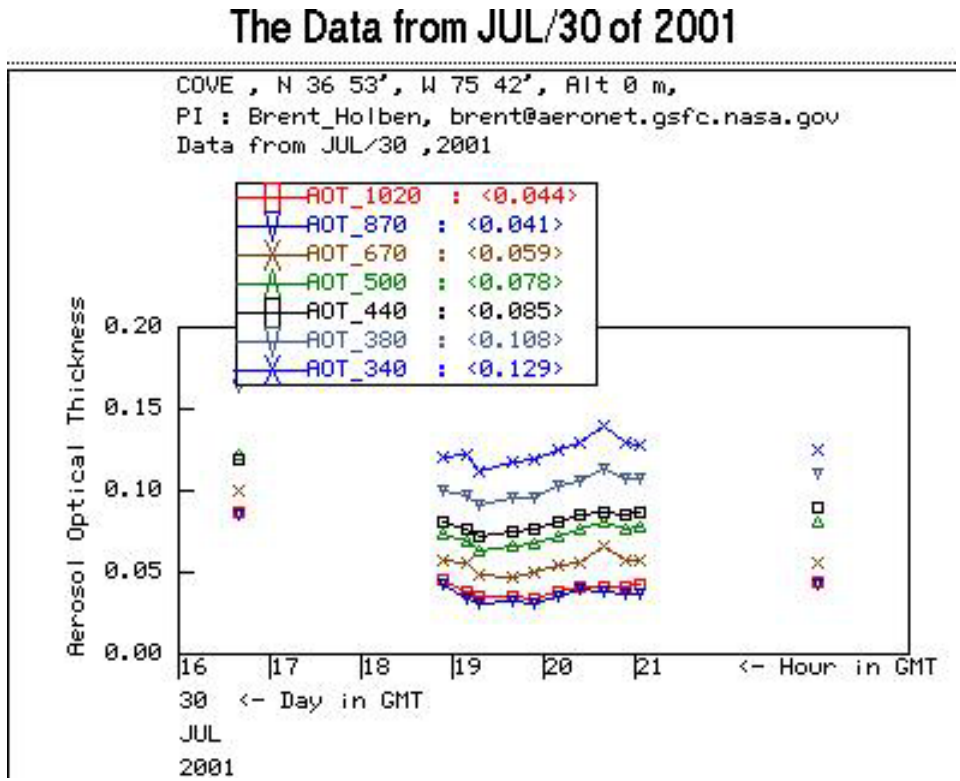


CLAMS: July 30, 2001

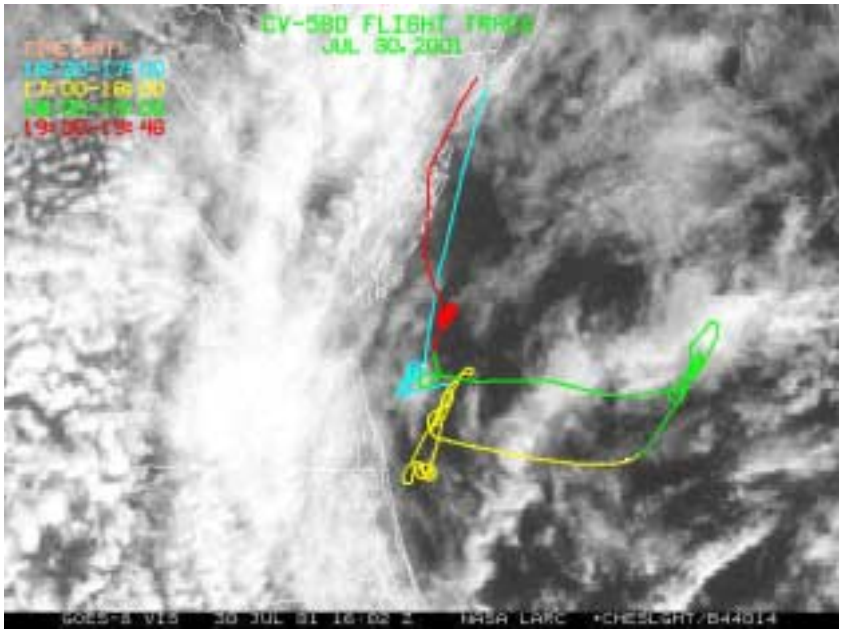
COVE WINDS



COVE AERONET



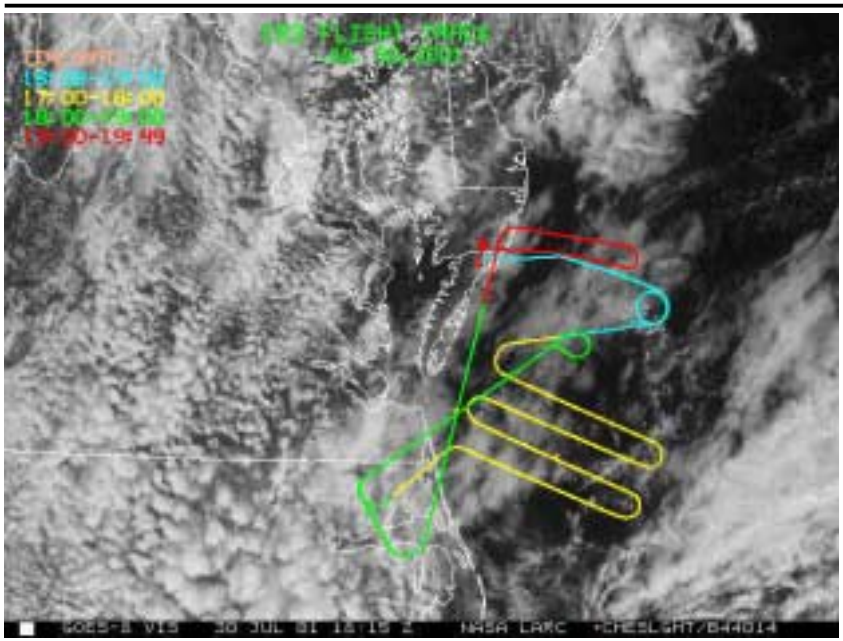
CLAMS: July 30, 2001



T/O = 1617 UTC
Land=1946 UTC

CV-580

- 100 ft AOD run towards COVE (clouds)
- BRDF near COVE
- Quick ascent to 10 kft in cloud-free area
- Slow descent to 100 ft near COVE
- 100 ft AOD run east of COVE
- cloud structure msmts at 5.5 kft
- BRDF north of 44014 (some clouds)
- BRDF north of COVE (clouds?)

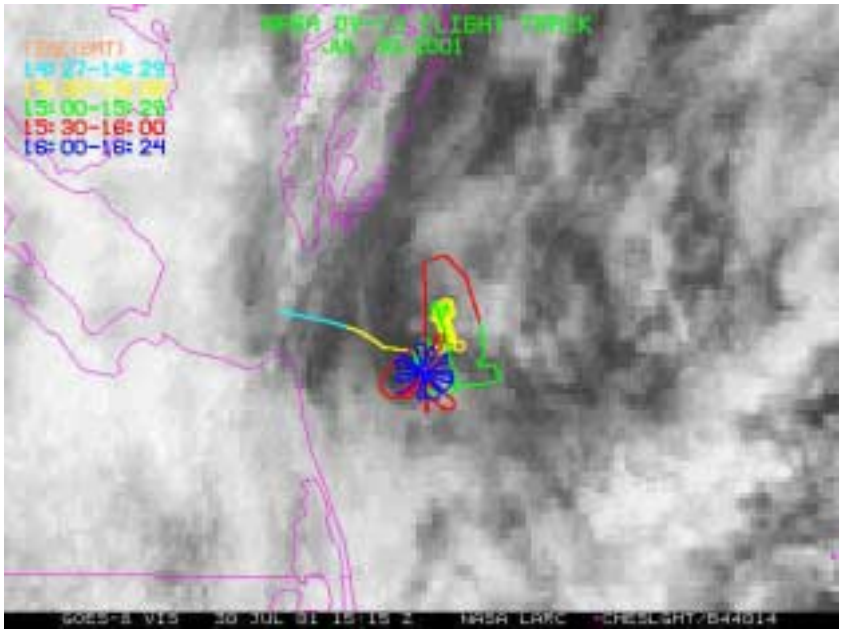


ER-2

- Glint pattern
- COVE leg parallel to TERRA track

T/O = 1628 UTC
Land=1948 UTC

CLAMS: July 30, 2001



OV-10

- 600 ft cropdusters below overcast
- 100 ft COVE fly-by
- 3500 ft daisy over COVE (above overcast)

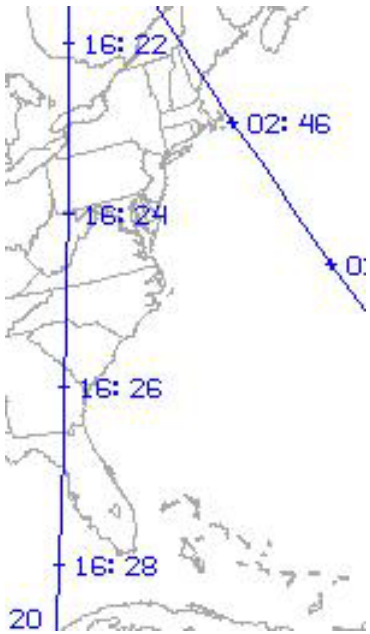
T/O = 1420 UTC
Land=1640 UTC

PROTEUS ????

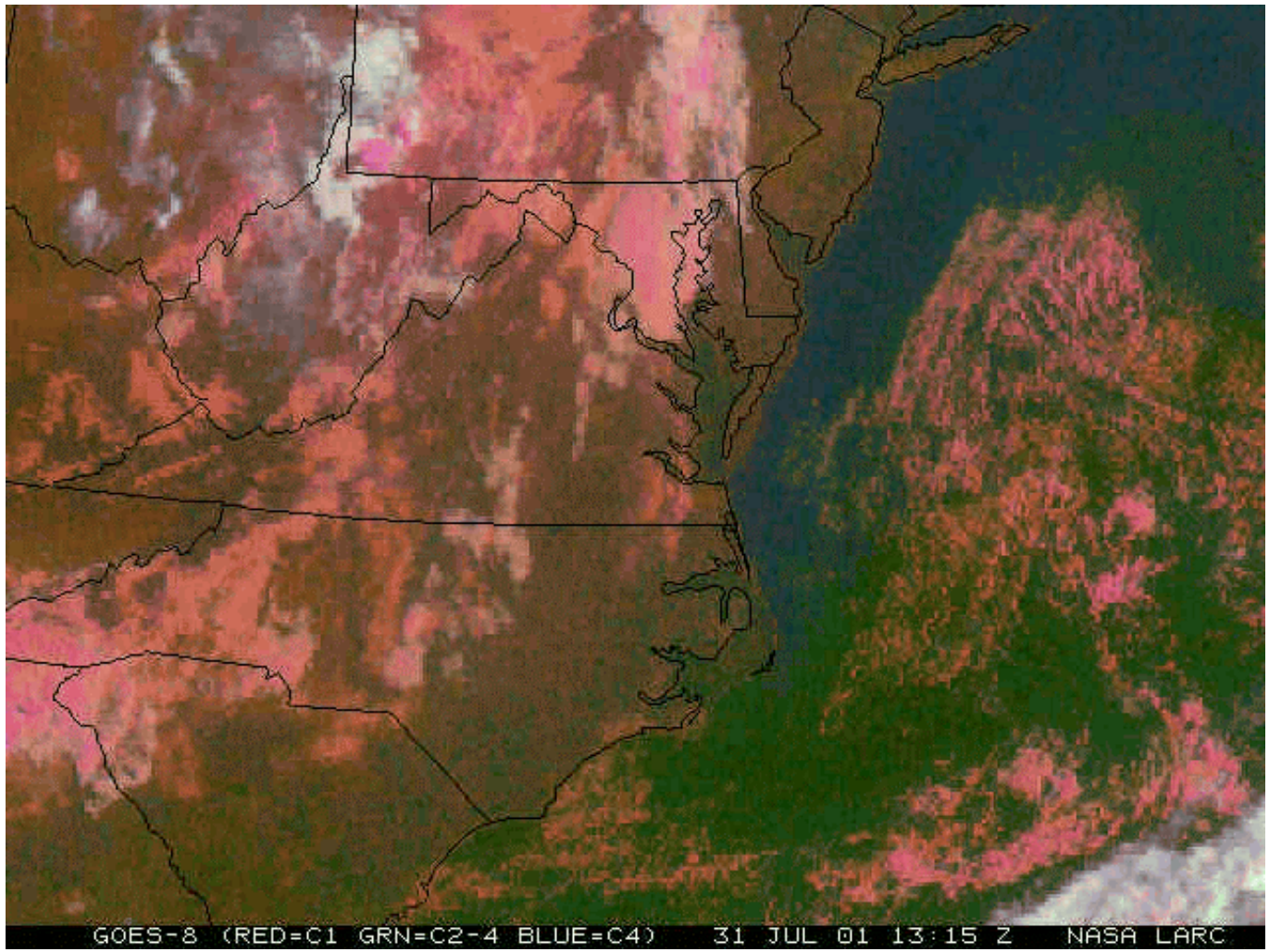
T/O = 1745 UTC
Land=2205 UTC

CLAMS: JULY 31, 2001
Satellite

TERRA

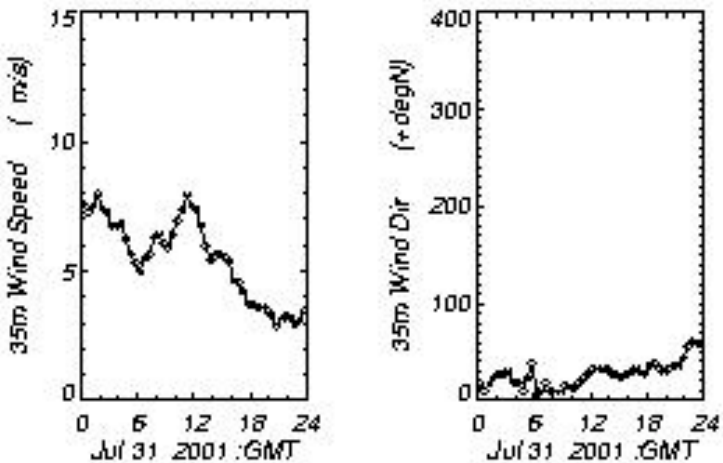


VZA = 35°

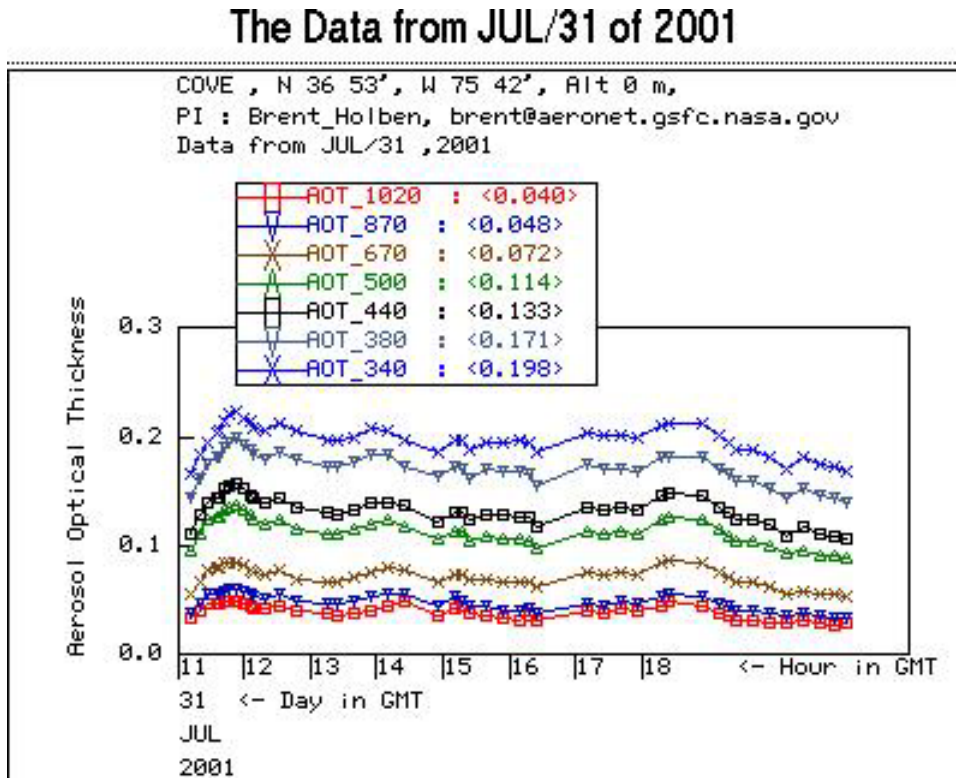


CLAMS: July 31, 2001

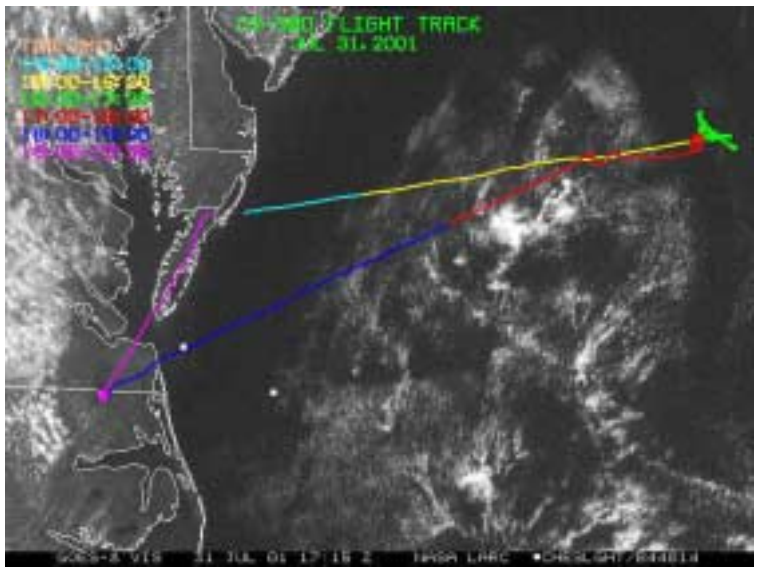
COVE WINDS



COVE AERONET



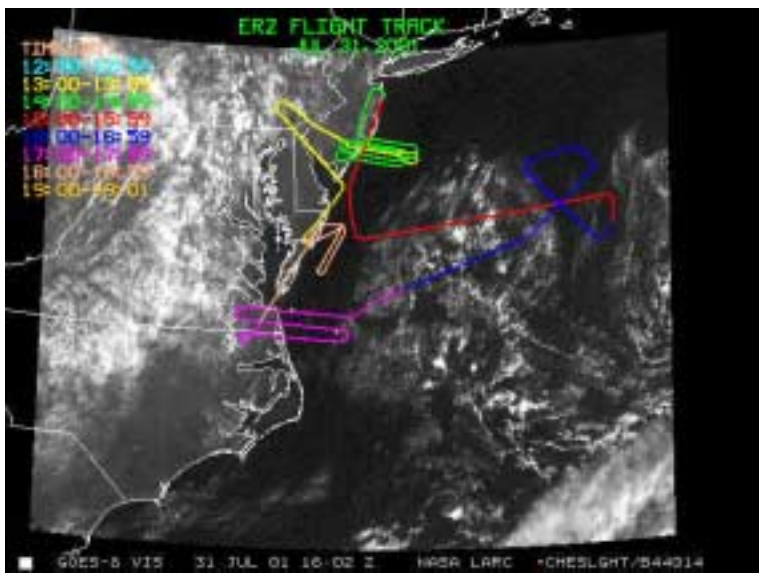
CLAMS: July 31, 2001



CV-580

- 100 ft AOD run at 44004 and TERRA overpass (mostly clear)
- BRDF 44004 (mostly clear, big waves, white caps
- quick profile to 10kft
- BRDF at Dismal Swamp

T/O = 1433 UTC
Land=1956 UTC

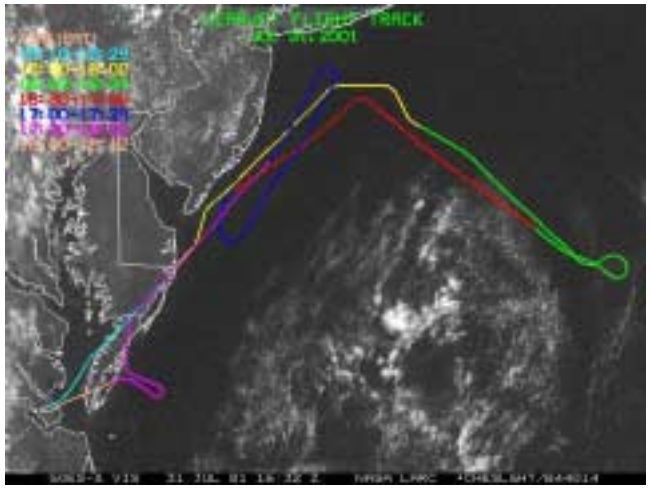


ER-2

- Three airMISR azimuths over 44004
- Tracks over COVE, Dismal Swamp
- Geo-Cal

T/O = 1259 UTC
Land=1857 UTC

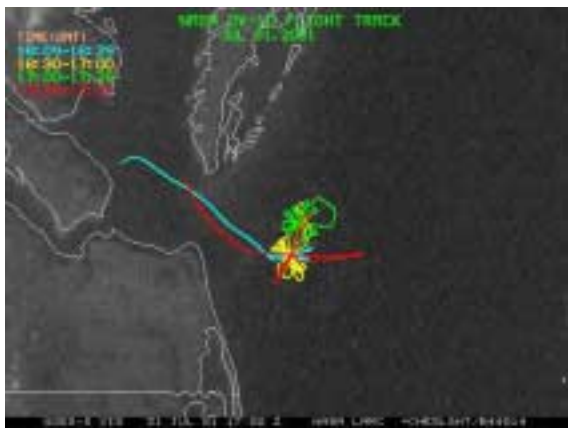
CLAMS: July 31, 2001



Lear Jet

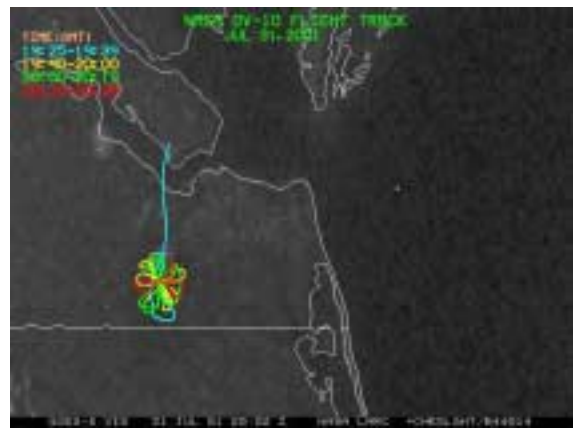
• Tracks at 40 kft parallel along coast and to 44004 with LAABS (A-band)

T/O = 1520 UTC
Land=1807 UTC



OV-10 (flt 1) T/O = 1607 UTC

• daisy patterns Land=1806 UTC
• 100 ft fly-by's (n-s; e-w)
• 600 ft run COVE to bay bridge



OV-10 (flt 2)

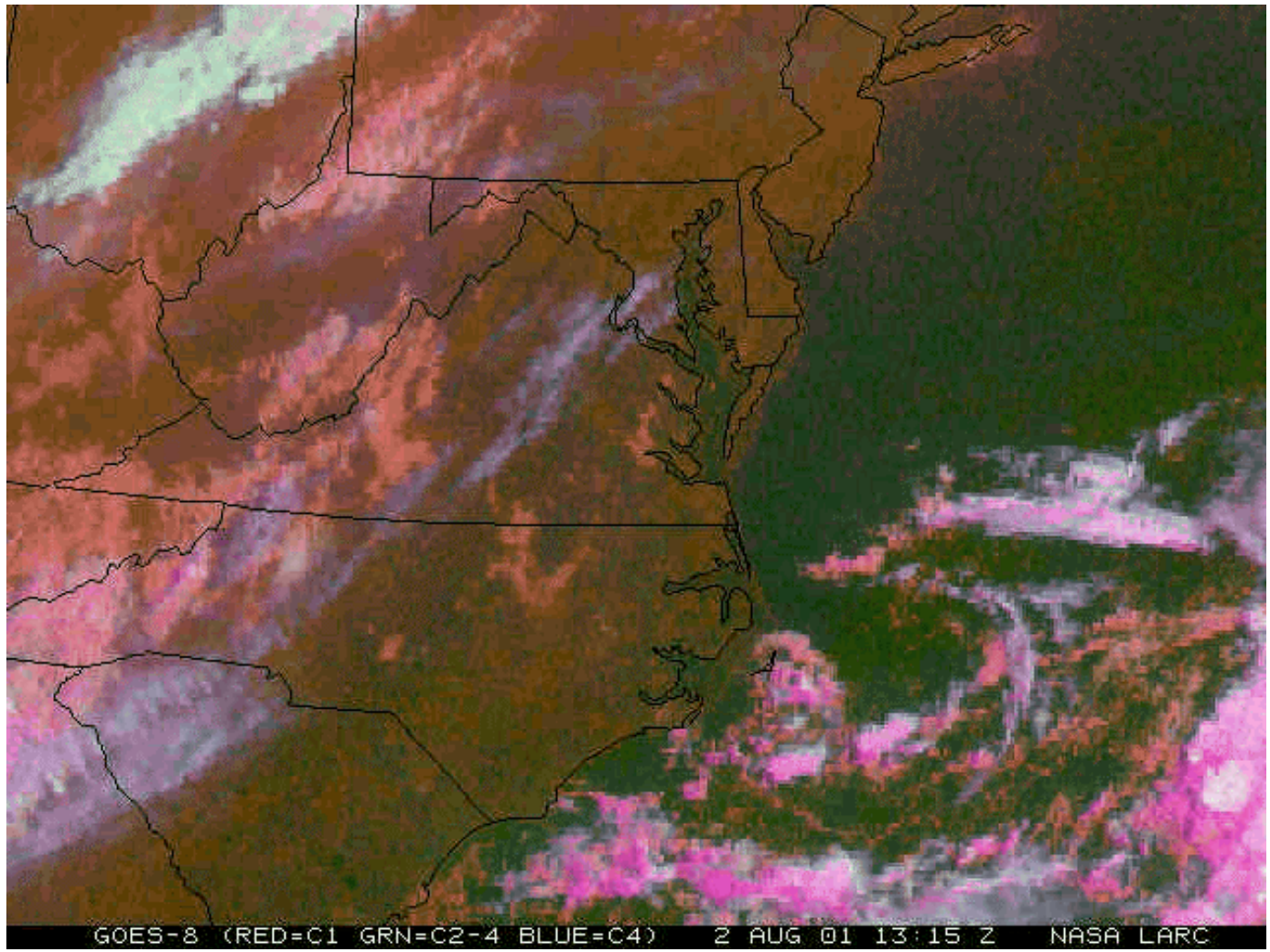
•Daisy pattern at Dismal Swamp

T/O = 1957 UTC
Land=2140 UTC

CLAMS: AUG 2, 2001
Satellite

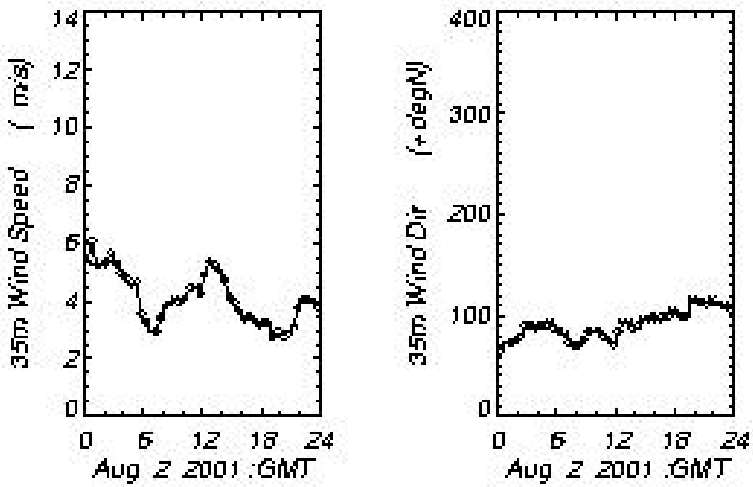
TERRA

VZA = 15°

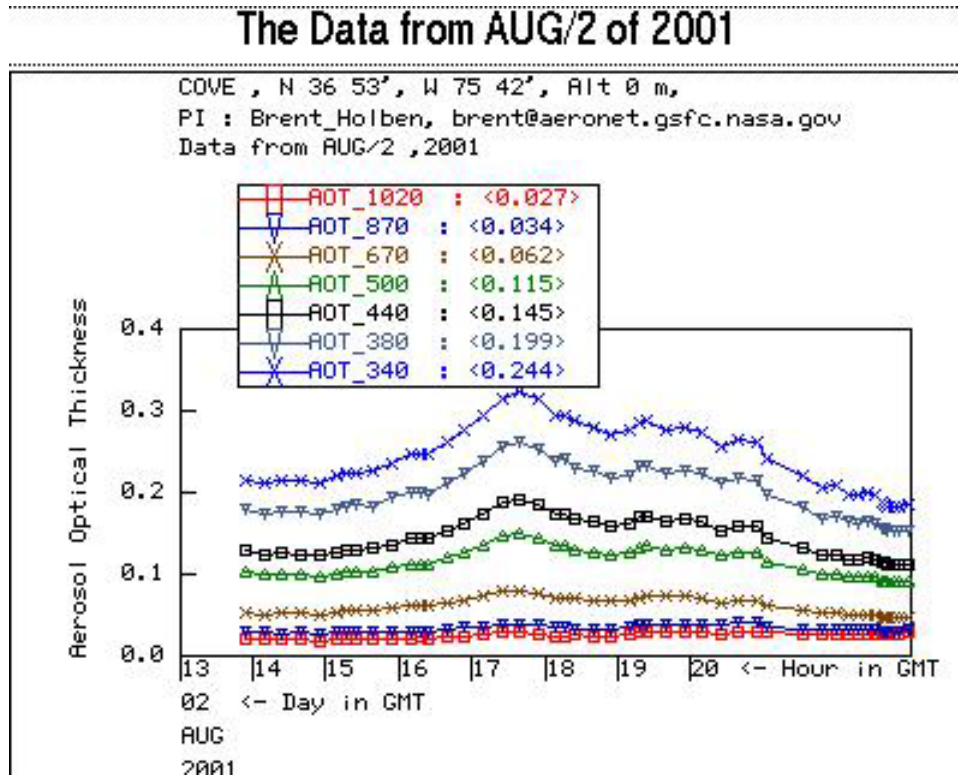


CLAMS: Aug 2, 2001

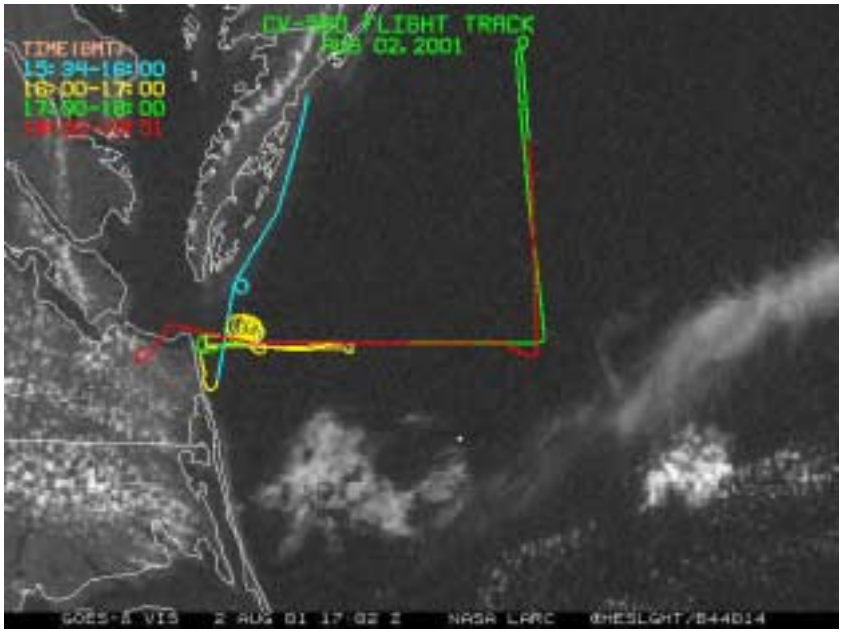
COVE WINDS



COVE AERONET



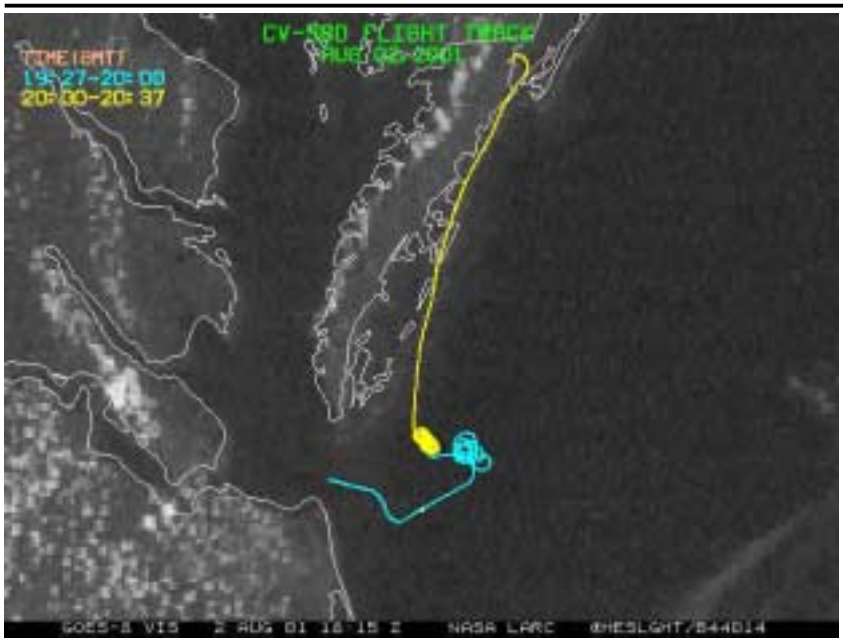
CLAMS: Aug 2, 2001



CV-580 (flt 1)

- 6000 ft transit to COVE - radiometer comparison with OV-10
- 100 ft AOD run at TERRA overpass
- Slow profile to 10 kft
- L-pattern at 2.9kft (maximum haze layer)
- Land Norfolk to free CAR door

T/O = 1530 UTC
Land Norfolk

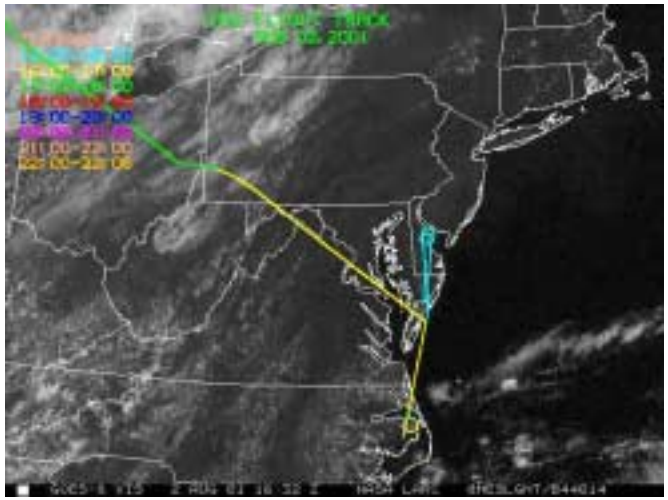


CV-580 (flt 2)

- Quick profile over COVE to 10kft
- 600 ft BRDF near COVE, low sun

T/O Norfolk
Land=2037 UTC

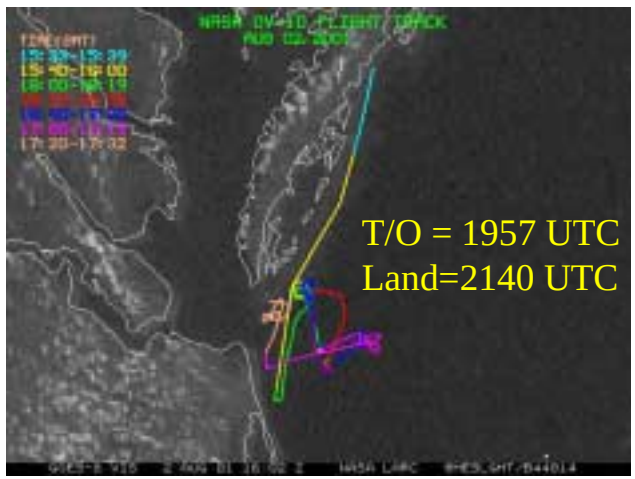
CLAMS: Aug 2, 2001



ER-2

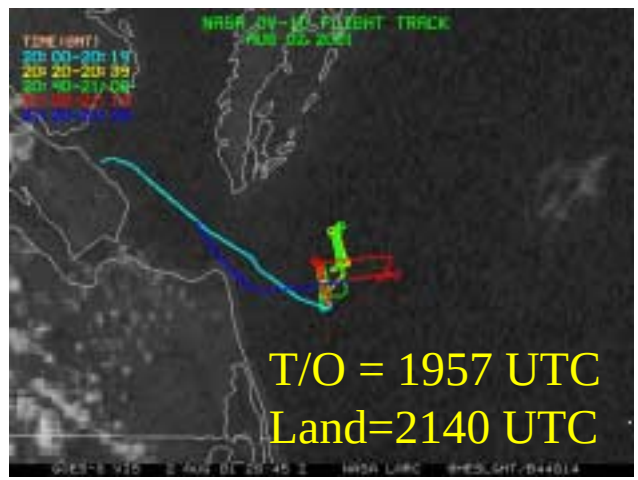
- TERRA overpass leg
- Geo-Cal
- Transit to Dryden

T/O = 1459 UTC



OV-10 (flt 1)

- Radiometer comparison with CV580
- Flux profiles (3.0, 2.4, 1.8, 1.2 kft)
- 100 ft COVE passes



OV-10 (flt 2)

- 600 ft cropdusters
- 100 ft fly-by